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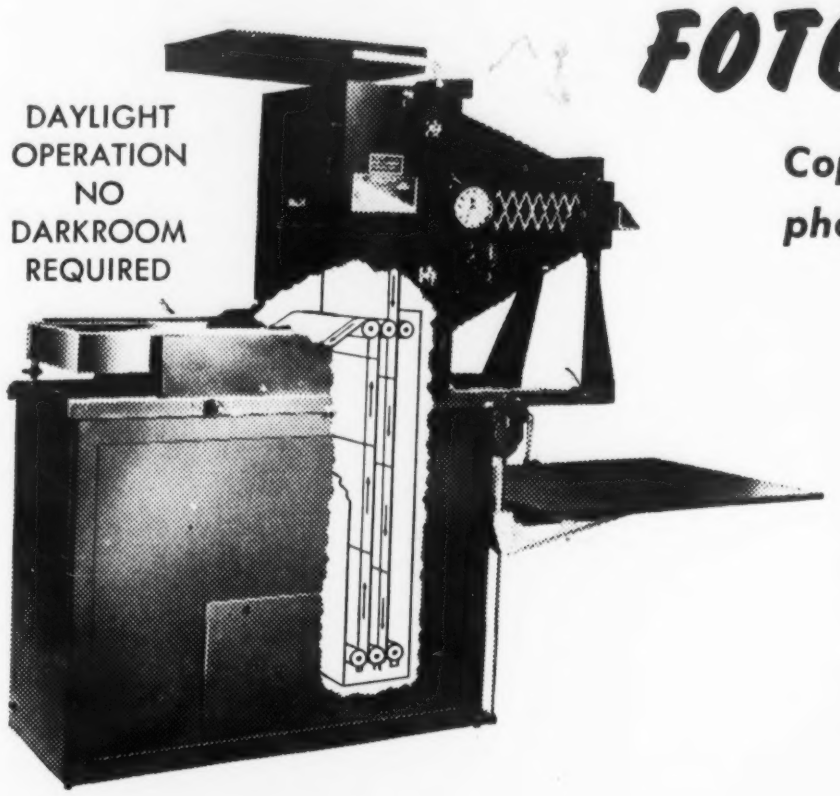

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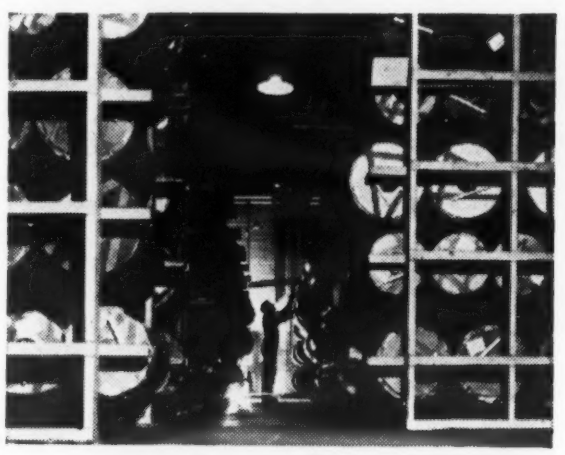

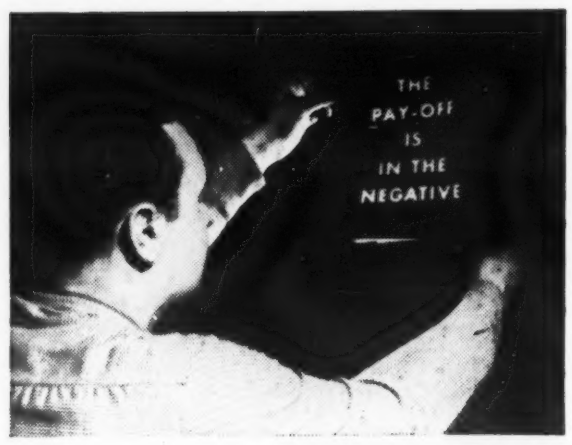

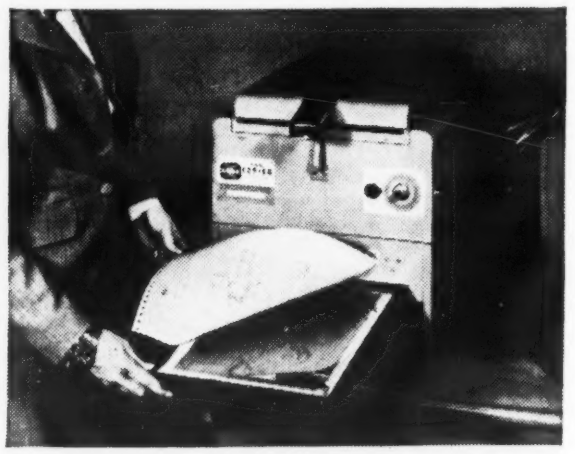

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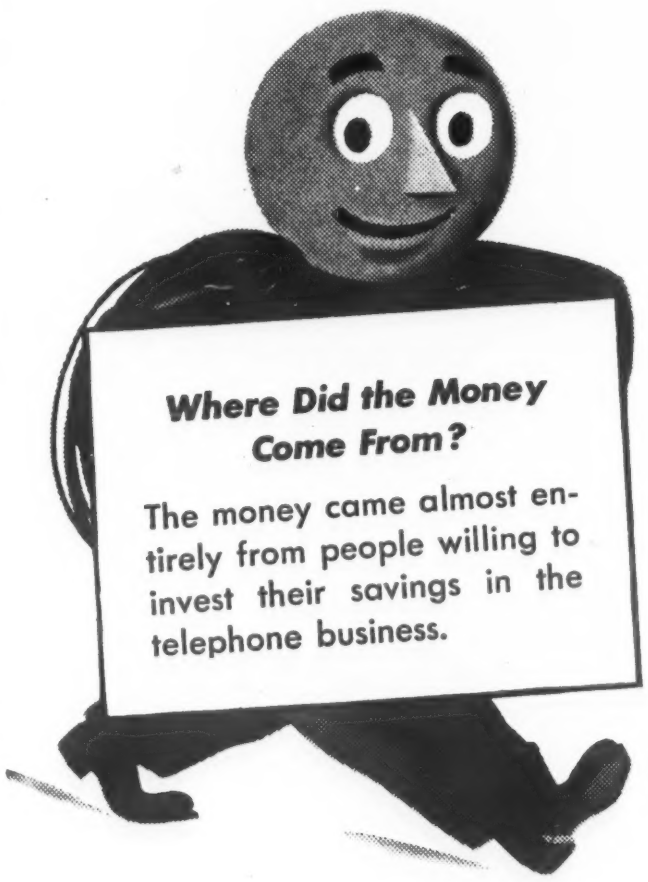

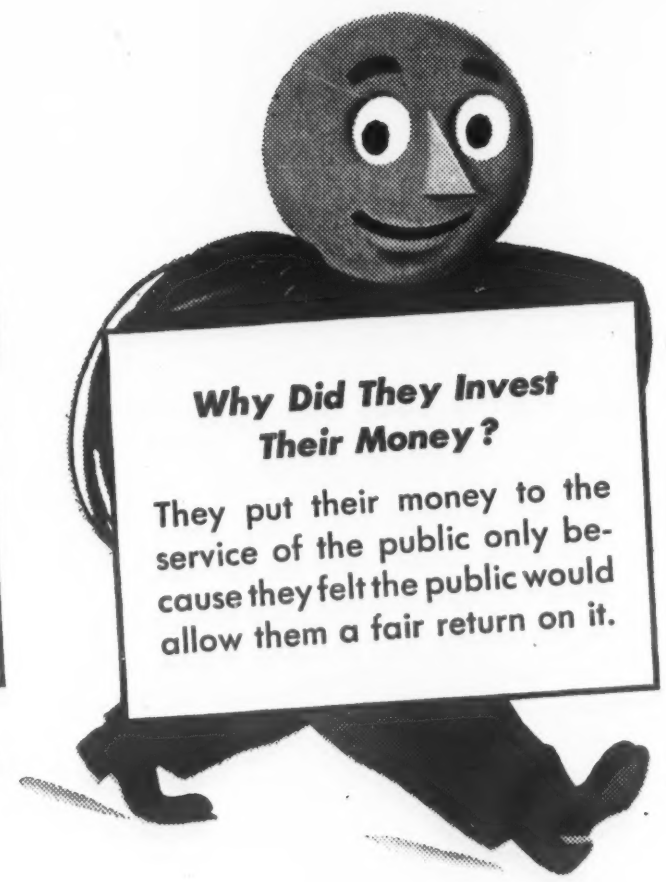

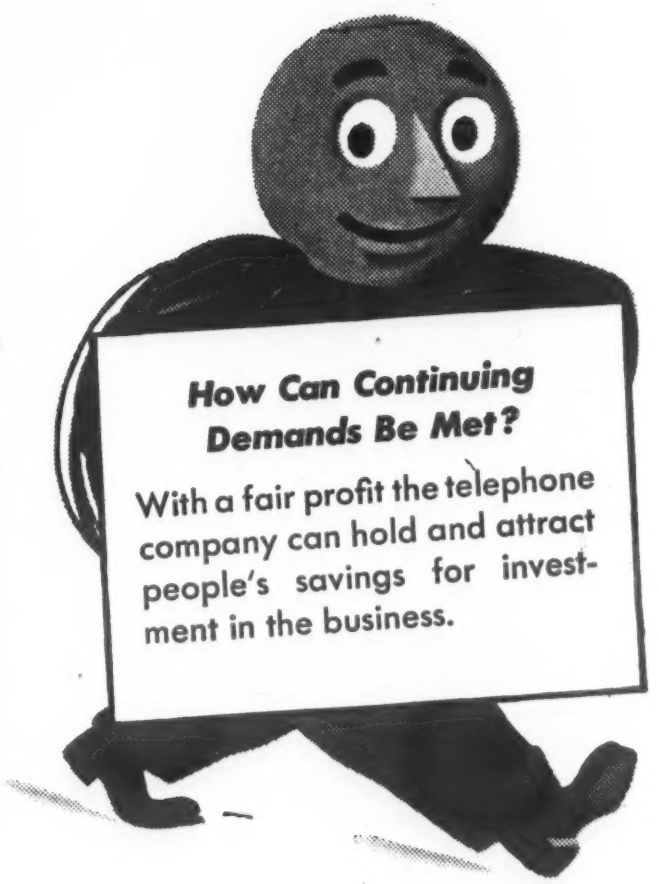

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SIGNAL

Communications-Electronics-Photography

Journal of the Armed Forces Communications Association

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COVER

The civil defense air warning control center, or filter center, is becoming more and more familiar to the U. S. A great team makes possible the thorough coverage and efficiency of this air warning system—the U. S. Air Force, which supervises the operation; the AT&T, with the greatest telephone system in the world; and the volunteer U. S. civilians who man the filter centers and the outlying ground observer posts.

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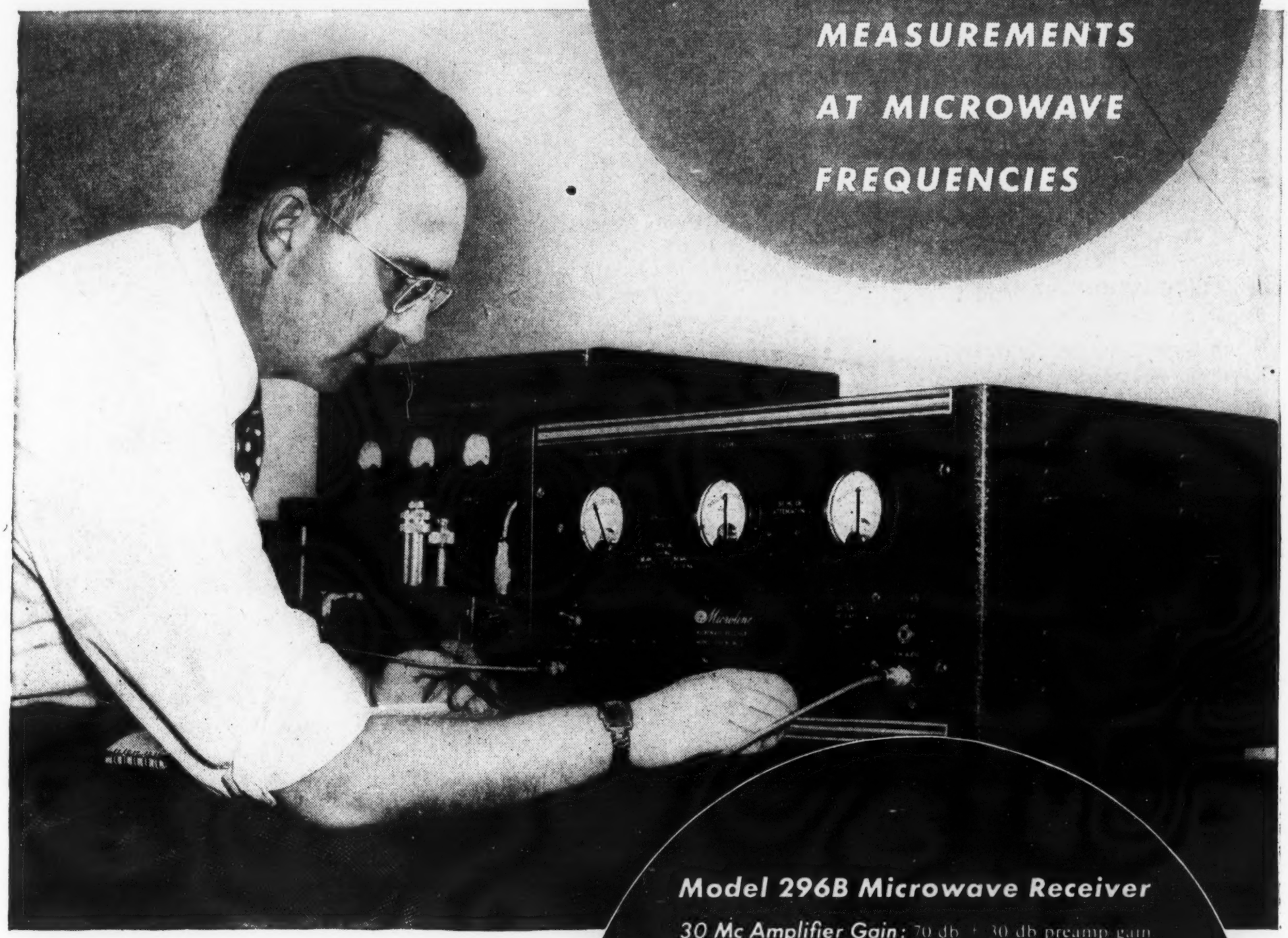

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IF Bandwidth: 1.8 Mc.

Attenuator: Insertion loss 15 db. 80 db attenuation range with detent positions at 10 db steps.

Local Oscillator Power Supply: Beam supply 600 to 800 volts 50 ma, continuously variable, positive grounded. Reflector supply continuously variable from - 10 to - 500 volts with respect to cathode.

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HANAC

By
Capt. August Mirzaoff, Jr.
and
T. J. Simpson
Headquarters AACS

Aircraft control communications systems are getting into the horse-and-buggy classification, since they have been standing still while aircraft altitudes and speeds have been steadily rising. The authors of this article are suggesting a solution to the problem.

HANAC (High Altitude Navigation Communication, deals with the communications and navigational problems attendant with aircraft flights conducted at extremely high altitudes. The problems are not peculiar to, nor are they restricted to, high altitude flying but they are representative of a few special and aggravated cases of a family of similar problems encountered during flights made at much lower altitudes and speeds.

The concepts on which HANAC are based assume that extreme altitudes describe any flights in excess of 20,000 feet. It further assumes that the following conditions will apply for those aircraft which are capable of operating efficiently at these altitudes:

a. The major proportion of such flights will be conducted above 20,000 feet whether for the purpose of long-range passenger or freight service, strategic bombing, interception or reconnaissance missions. No short range flights at extreme altitudes are practical.

b. Aircraft cruising speeds will be in excess of 600 mph.

Under the conditions stipulated above, HANAC will endeavor to show that the need for a large number of individual communications contacts with ground stations should decrease. Similarly, the operational need for a large number of ground navigational aids will be greatly reduced. This statement must not be interpreted as meaning that the actual number of such facilities can be materially reduced as speeds and altitudes increase, but that a pilot flying at high altitude may have operational need for only a portion of existing or proposed facilities (such as the VOR) instead of all such facilities along a particular air route.

In examining the communications problem first, it is necessary to visualize the magnitude of mutual channel interference, and some of the factors that contribute to its existence. A portion of these problems is due to natural phenomena, others are man-made. Altogether they generate a highly undesirable situation.

The present radio broadcast band, covering the frequency range of 500-1600 Kcs, is representative of an unhealthy condition in radio communications insofar as mutual interference is concerned. Excluding reception from near-by relatively powerful stations, one can find an unintelligible bedlam throughout most of the broadcast spectrum when tuning from one end of the broadcast band to the other (500 to 1600 Kcs). Attention has been called to this bizarre picture since it is one familiar to everyone possessing a broadcast receiver, and is illustrative of the worsening air communications situation confronting the majority of military, commercial and private pilots. This situation is the result of several very obvious factors; one of which is the progressive increase in both the number of flying aircraft and ground radio installations. Some measure of relief has been gained by moving communications to the very high frequency spectrum where more individual channels were available, and where communications contacts are ordinarily limited to line-of-sight distances (a propagation characteristic peculiar to higher frequencies).

The quest for clear channel service now has spear-headed air communications into the ultra-high frequency spectrum resulting in greater availability of separate channels and a "line-of-sight situation" even more pronounced than that found in the VHF spectrum. The answer cannot be found in this direction, however, for to demand more and more channels ultimately brings the program into sharp conflict with other services who also have vital interests in this part of the radio spectrum. Furthermore, there would appear to be a practical limit to the number of channels that could be made available to a pilot, disregarding equipment limitations for the moment. To go beyond this number, what ever it may be, may complicate rather than simplify the communications problem strictly from the operator's point of view.

Since the advent of the jet aircraft, the altitude ceiling has been raised until now a height of 40,000 feet is considered a routine jet altitude. Jet aircraft also perform more efficiently at the higher altitudes. Although flights at these altitudes are currently enjoyed by the military, the British are demonstrating that jet transport operations are quite possible at the higher altitudes so that in the future, it is not unlikely that considerable commercial air activity will be conducted at 40,000 feet and above.

Heretofore, lower altitudes and the line-of-sight propagations characteristics of the higher frequencies have been natural barriers in maintaining mutual radio interference (due to propagation phenomena) at a tolerable level. The lack of strict communications procedure discipline, lengthy call-up procedures which contain relatively little information, and lengthy messages, on the other hand, have been largely responsible for the interference encountered at conventional flight altitudes. (It is anticipated that with the coming of radar control of air traffic, the need for verbose message exchanges such as clearances, position reporting, etc., will decrease, thus somewhat reducing the amount of radio interference.) Now, as the altitude ceiling is raised, the ground coverage of the aircraft's communications system increases in accordance with the "distance-to-horizon" or line-of-sight law so that more and more ground communi-

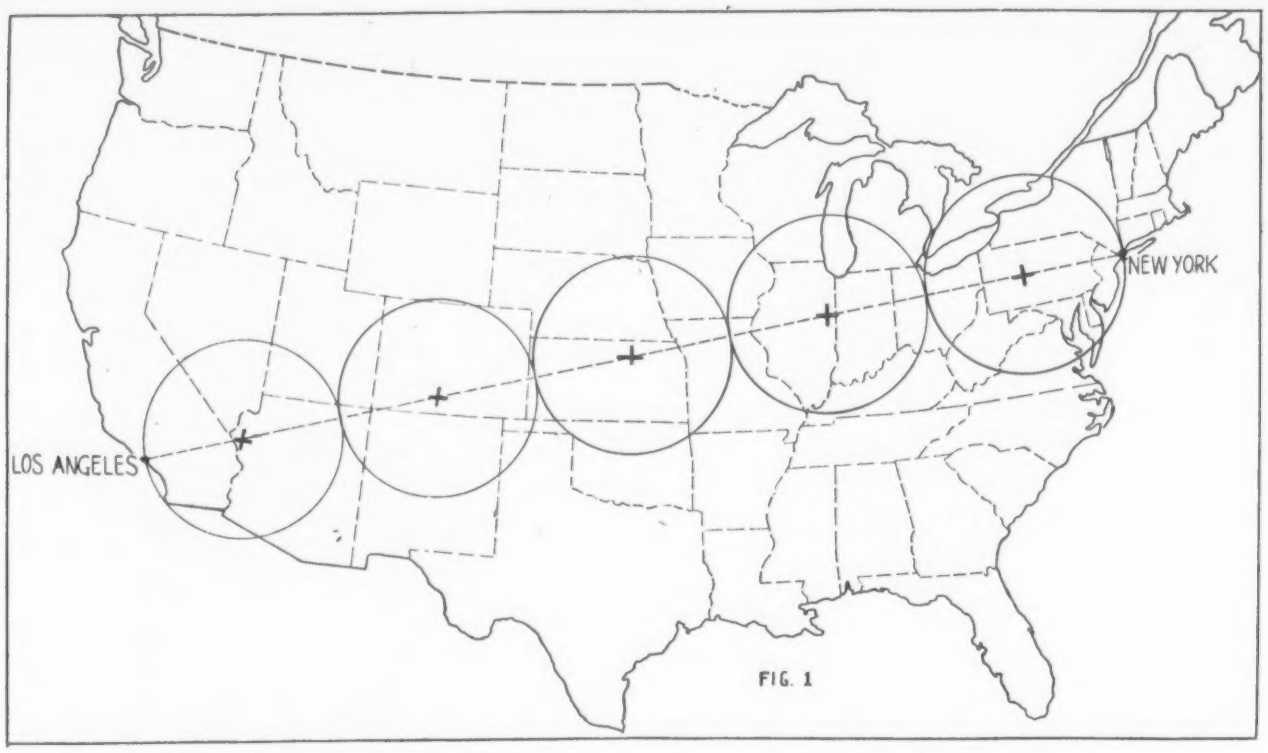

FIG. 1

cations stations are encompassed within the communications range of the airborne equipment operating at higher levels.

For example, an aircraft flying at 15,000 feet is theoretically capable of contacting any station within a circular ground area whose diameter is approximately 345 miles. At 40,000 feet this area has expanded to 560 miles with a corresponding increase in the potential number of ground stations that can be contacted.

It is evident, therefore, that the jet pilot is approaching a communications situation similar to that depicted in the foregoing broadcast band example. For any given frequency at these altitudes, the jet pilot must mix his communications with the multitudinous communications exchange between lower flying aircraft and the many ground stations involved. Coupled with a lack of procedures discipline, his interference problems obviously becoming intolerable. For example, consider what may happen when the jet pilot sends out a distress call. All of these ground stations within hearing radius will respond to his distress signal in accordance with procedures developed for emergencies. Furthermore, it is to be expected that all hearing his call will answer since none of these stations can be sure that the neighboring station has heard the call. The result of this well intended help is that the pilot finds himself confronted with the aforementioned unintelligible bedlam. Since he doesn't know who, and how many ground stations are trying to aid him, he cannot ask Station "A" to remain silent until he has received instructions from Station "B." On the other hand, if instead of having 50 or more stations respond to his call, his contacts were limited to three or possibly four stations, he stands a much better chance of exercising a personal control over the communications situation.

The same reasoning is applicable to the general communications problem where instead of being exposed to many stations, his contacts were limited to a few, the air-to-ground communications traffic would be greatly simplified.

It was stated previously that an aircraft attaining an altitude in excess of 20,000 feet would, in general, be flying a long-range mission, and probably at a cruising speed in excess of 600 mph. Consider an aircraft enroute direct from New York to Los Angeles and flying at 700 mph. This flight would take a little over four (4) hours. Ordinarily, weather at these altitudes is limited to well-developed thunderstorms and turbulence. Until there are radical advances in the science of weather forecasting based on ground observations, the accuracy of present day weather forecasts for these altitudes is relatively poor and, therefore, of little use to a pilot flying at extreme altitudes. This is especially true of the turbulence of phenomena encountered during perfectly clear weather conditions. Except for terminal area weather and emergencies, this pilot will have little interest in weather conditions between the surface and 20,000 feet along his route.

The concept of enroute air traffic control for such flights appear to be in need of change, in fact, to the extent that enroute traffic control may necessarily be vested in the cockpit and not within a ground agency. Position reporting every twenty-five (25) to fifty (50) miles no longer seems to be an operating requirement. These then are the operating requirements that are responsible for the generation of the major portion of air/ground communications today which may well be curtailed tomorrow.

From this, it can be concluded that the number of air/ground contacts which are now required to provide navigation and communication service throughout the U. S. is far too great for the simple requirements of high, fast flying aircraft.

The present system was installed to accomodate aircraft with a top speed of 200 mph and a flight altitude not averaging higher than 10,000 ft. MSL.

With the coming of jet aircraft, pressurized cabins, higher speeds and cruising altitudes, it becomes necessary to revise our 10,000 ft/200 mph communications system procedures concept.

The propagation characteristics of UHF and VHF essentially limit communications to line-of-sight distances. In order to determine the approximate communications range of an aircraft at altitude, we may apply the formulate $1.4\sqrt{\text{altitude/feet}} = \text{range in miles}$. Therefore, aircraft flying at 40,000 feet have a theoretical communications range encompassing a circle of 260 miles radius whose center is located directly beneath the aircraft and which circle represents an area of roughly 53,000 square miles. In some sections of the country, particularly in the Northeastern U. S., this area would include perhaps 75 to 100 communications stations. It becomes evident then that an emergency call from the aircraft at 40,000 feet would be heard and answered by perhaps 75 to 100 stations. The confusion and interference that could result would certainly not be conductive to expedite remedial action.

Position reports, weather data, and, in fact, any type of communications attempted by the high flyer must filter through many other transmissions originating at lower altitudes. This creates an interference problem for the

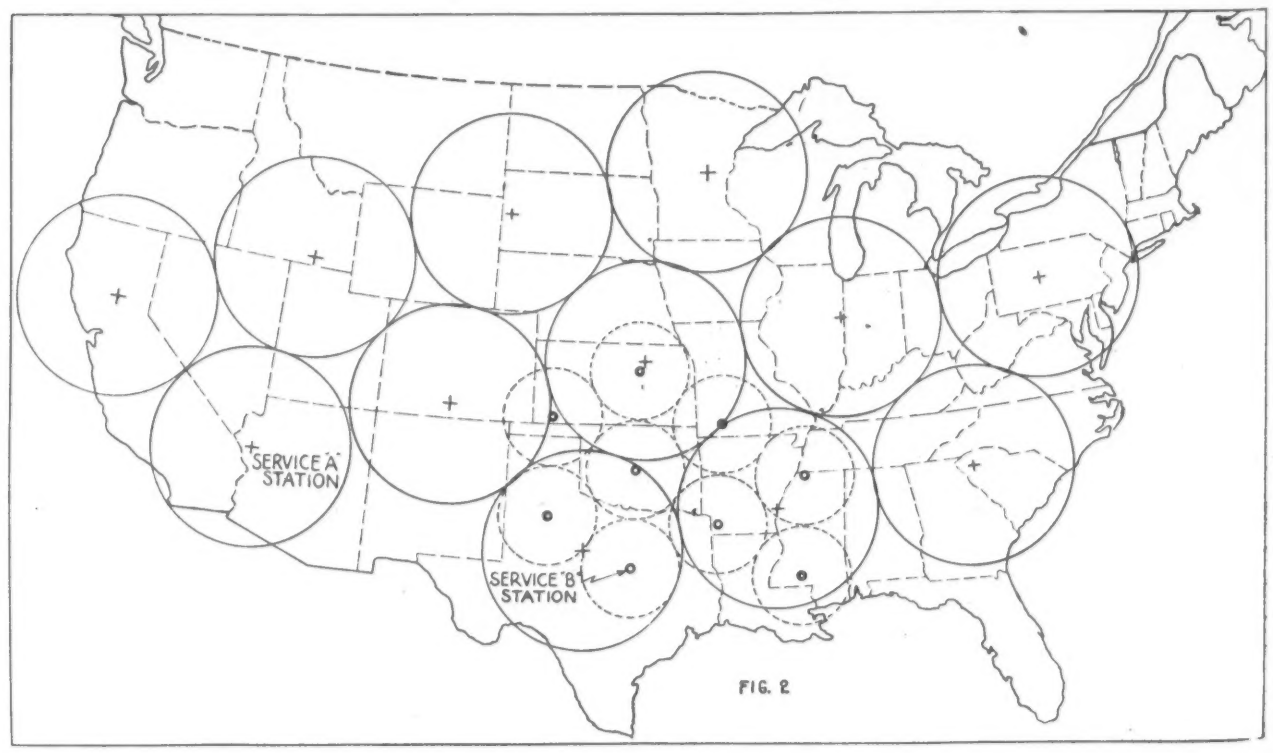

FIG. 2

Thompson J. Simpson (Major USAFR) is communications engineer in the flight facilities division, directorate of operations, Hq. AACS, Andrews AF Base, Md. A graduate of Rugby Military Academy and Tulane University, he holds a BA degree in engineering. He has been a radio instructor at Scott Field and a radar instructor at Boca Raton AAF, Fla. He holds a reserve commission as a Major in the Air Force.

lower aireraft and to all the ground stations within range regardless of whether or not they are concerned with the specific transmission.

The solution to this problem is relatively simple. Suppose a transcontinental run is made between New York City and Los Angeles by an aircraft at 40,000 feet or higher. At this height, the communications area of this aircraft is a circle of roughly 500 miles diameter. In referring to Figure 1, one observes that the great circle distance between these cities, which is about 2,500 miles, will accommodate five (5) of the 500 mile circles as shown. Now, if a communications station is located at the center of each of these circles this aircraft will be assured continuous contact with the ground since at no time during its flight will it be more than 250 miles distant from one of these stations. Note that in this example, continuous communications is possible utilizing only five (5) radio stations. Furthermore, the contacts with these stations will be limited to a designated frequency (or a family of frequencies) specified for the 40,000 foot altitude.

Let this frequency or family of frequencies set aside for this altitude be designated as Channel A, and all stations authorized communications on Channel A be designated as Class A stations. This is merely for convenience of discussion.

Since aircraft may fly any of an infinite number of different routes, it will be necessary to establish a pattern of circles tangent to each other as shown in Figure 2, with a Class A service radio station at the center of each circle. To provide nationwide Class A communications service with aircraft flying at 40,000 feet, it only becomes necessary to "fill up" the geographical area of the U. S. with an appropriate number of these "communications circles."

It follows then that to provide a Class B service to aircraft flying at say 30,000 feet, the above concept is reapplied for the lower altitude which, in turn, will generate a second family of circles having a smaller diameter whose respective stations conduct their operations on a B channel frequency or family of frequencies. Similar reasoning can be applied to lower altitudes, thus establishing a Class C service if found necessary. In this manner, communications are not intermixed in the same ratio as they are under the current communications procedure, thus mutual interference will be reduced considerably.

It should be noted, however, that even though a station is authorized communications on one service only, undoubtedly, such stations will have receiving facilities on all radio channels regardless of their service classification. This, in essence, is the HANAC concept; a geographical distribution of class of service among ground radio stations in terms of flight altitudes.

It is to be noted that insofar as a facility is concerned, it may be authorized communications on all of the service classes by virtue of its geographical position with relation to adjacent stations. This is readily obvious for if one superimposes a Class B service circle family on a Class A family, many of the centers will coincide or be so

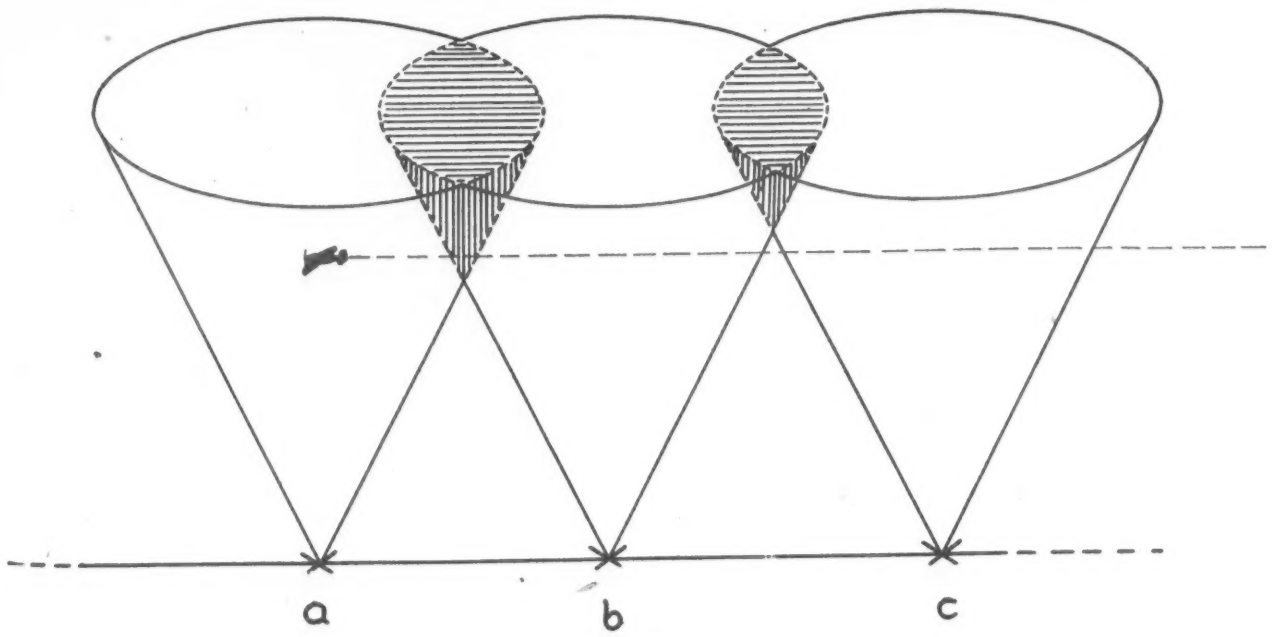

Fig. 3.

Capt. August Mirzaoff, Jr. is chief of the air communications branch, directorate of operations, Hq. AACS. He served nearly all of the WW II period as a B-25 pilot in the Pacific. In 1945 he was assigned to AACS and served two years with the 52nd AACS Group at Mitchel Field, as operations communications officer, and later as executive officer of the 122d Squadron in Canada. He went to Hq. AACS, in 1949.

close to coincidence, that for practical purposes, the two services can be incorporated within the single radio station.

The HANAC principle is not limited to the communications problem. It is also applicable to navigational aids, particularly those in the VHF and higher radio spectrum. The VOR is a good example of a facility that can make use of this principle, for jet pilots in particular, are encountering mutual interference of VOR signals at extremely high altitudes. This is to be expected because there has been limited planning with respect to VOR frequency assignment versus geographical distribution.

Again consider, for the moment, the aforementioned transcontinental run from New York City to Los Angeles. Referring to Figure 3, each cross represents a possible VOR station. Assume for the moment that several of these stations are operating on the same frequency, a few of which have a geographical separation of 300 miles or less, such as indicated by a, b, and c. An aircraft flying at 10,000 feet will encounter interference about mid-way between these stations. If this aircraft flies at a higher altitude, this interference zone becomes larger as shown in Figure 3.

To avoid this condition it simply requires a decision as to what altitude level it is desired to raise this zone of interference. Upon determining this altitude it becomes a simple matter to stagger VOR frequencies in terms of geographical separation to satisfy the requirement.

Suppose it is decided that VOR stations for use along the transcontinental run shall not have interference zones

(*Continued on page* 80, *col.* 1)

DUCK!—Then Up and "At-Om"

By Major Thomas M. Rienzi

You are now in the open, close to a city. Your unit has been stationed in its environs preparing for a military or a civil defense situation. Let's liken the town to Boston, Chicago, San Francisco, or Honolulu. As we go about our daily job, word comes that we may be under an atomic raid. As a consequence, we hope to prepare and know what we can do about this attack. While we are thinking about what we should do—out of the sky drops a bomb. As it falls, if one might see inside the weapon the workings of the gun or implosion principle used in the atomic fission reaction ("A"-Bomb) it would be noted that the gun action is extremely simple. We might portray a gun barrel with a piece of fissionable material (Uranium 235, U-235) at either end, which at the proper altitude will be propelled together, becoming critical and giving us our nuclear explosion (Figure 1). We may also envision the implosion type bomb where a piece of fissionable material is held in our weapon. At the proper height, an implosion takes place which squeezes the fissionable material, and in the following compression, force the atoms to become critical and explode as an atomic bomb (Figure 2).

Now that we have described our setting and have the missile on its way. let's assume that at about 2000 feet in the air, the so-called nominal atomic bomb (20,000 tons TNT energy equivalent) explodes. These facts and the reactions described, are from the Japanese explosions that took place at Hiroshima and Nagasaki on the 6th and 9th of August 1945 and in later atomic tests. We hope they impress you and give you a feeling for what happens. As the bomb explodes, coming out from the point of detonation is a God-awful awesome white light, startling and dazzling to the human eye sounding like the rumble of orchestral kettle-drums. This white light is a few million degrees of temperature and it soon will move out in a spherical ball about eight hundred feet in diameter. Through its thermal effect it will send a brilliant magnesium colored light to ground in about 1 second, and this same white magnesium colored mushroom will extend up in the air anywhere from 30,000 to 70,000 feet in from 5 to 10 minutes, thus giving us the typical "A"-Bomb mushroom. As this magnesium colored light rises, coming out of the sides of the stalk of our mushroom is a champagney blue fuzz called ionization. Also, as the stalk of the mushroom grows in width and height one will see a brown cloud forming at about 20,000 feet, which is an oxide of nitrogen made from the air by the action of the terrific heat of the bomb on the atmosphere. Further, as the atomic cloud hits the ground, a dense brown haze is seen which is the blast wave throwing debris about on the surface of the earth.

This is the picture of the bomb exploding. Let's review it—a brilliant flash—a fireball—a roaring sound—a stalk and head of a mushroom 30,000 to 70,000 feet high, with a champagney blue fizz coming out of the sides—a brown cloud at 20,000 feet with a brown haze on the ground.

We now know what caused this awe-inspiring, God-awful, horrible picture. It came in about a millionth of a second by either the gun or the implosion principle setting off the "A"-Bomb reaction. When it takes place three major effects are emitted from the weapon. First, Blast, which is an over-pressure wave traveling initially above the speed of sound, and then at the speed of sound which is very typical of our high explosive blast detonations.

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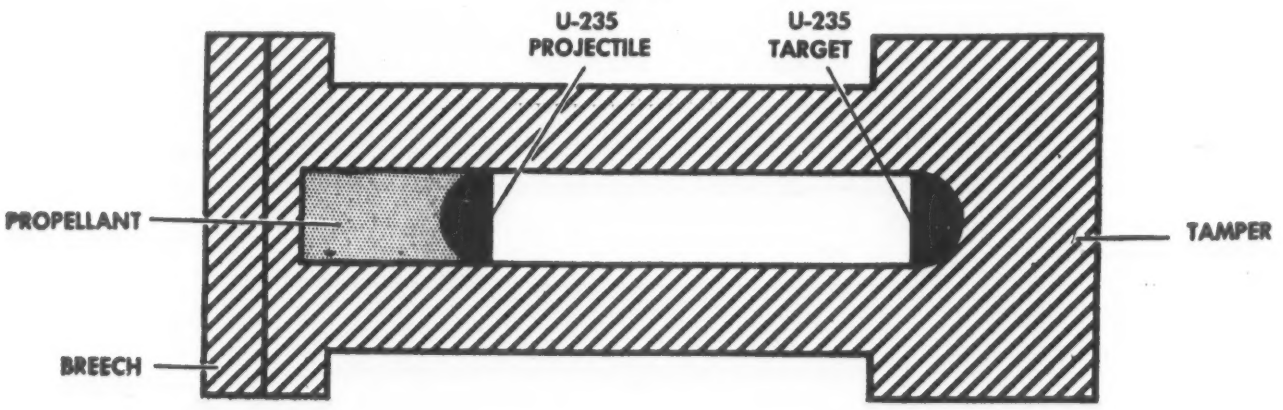
Fig. 1.



Major Thomas M. Rienzi is at present a senior instructor with the Armed Forces Special Weapons Project, Sandia Base, N. M. A 1942 graduate of the U. S. Military Academy with a B.S. degree, he received his M.S. in electrical engineering from the University of Illinois in 1948. He is a graduate of the Army Command and General Staff School. During WW II he served in the Burma theater, and after the war was an instructor at the Signal School, Ft. Monmouth, and an observer at the Nevada and Pacific Atomic Tests in 1951.

The next thing, not necessarily in time, but in the way we desire to discuss it, is thermal radiation. We will call it Heat as it is infra red to ultra violet with the spectrum between. known as visible light. I think this is best described as just a quick sunburn. since this heat is about a thousand times hotter than the surface of the sun which has been estimated at about 5000 degrees of temperature.

The third and final effect is ionizing radiation which we will just call Radiation. These radioactive particles, or rays, are four in number. Alpha particles which are ionized "hunks" of helium. Beta particles which are electrons about which you learn in school. Gamma rays are just like X-rays, therefore, since almost everyone has had a chest X-ray, everyone knows about this type of radiation. Finally, neutrons which are neutral particles of matter.

Having told you how the fission reaction could take place, that is by the gun or implosion principle—having drawn the picture by defining and describing the effects that come out of the weapon—let's see what happens to us on the ground near our city of Boston. Chicago, San Francisco or Honolulu.

As the bomb explodes, we have damage to structures and to personnel. Let us discuss structures. There are two ways that structures can be damaged—first by blast—secondly by fire. The blast in buildings is caused by the over-pressure wave, which generates winds up to 100 miles an hour, at a mile and a half from the explosion. The number of buildings wrecked by blast in the Japanese incidents were in tens of thousands. Typical damage to be expected is as follows: Out to a mile complete destruction except the most strongly reinforced concrete structures; these ultra strong buildings were probably gutted, as the windows were broken, the doors knocked down, the brick veneer removed, and some major structural members destroyed; out to about a mile and a half it certainly would do major damage to your home; and out to two miles lots of repair would be required to brick structures. The greatest energy "giver" of the bomb is blast and certainly one of the major things to prepare against.

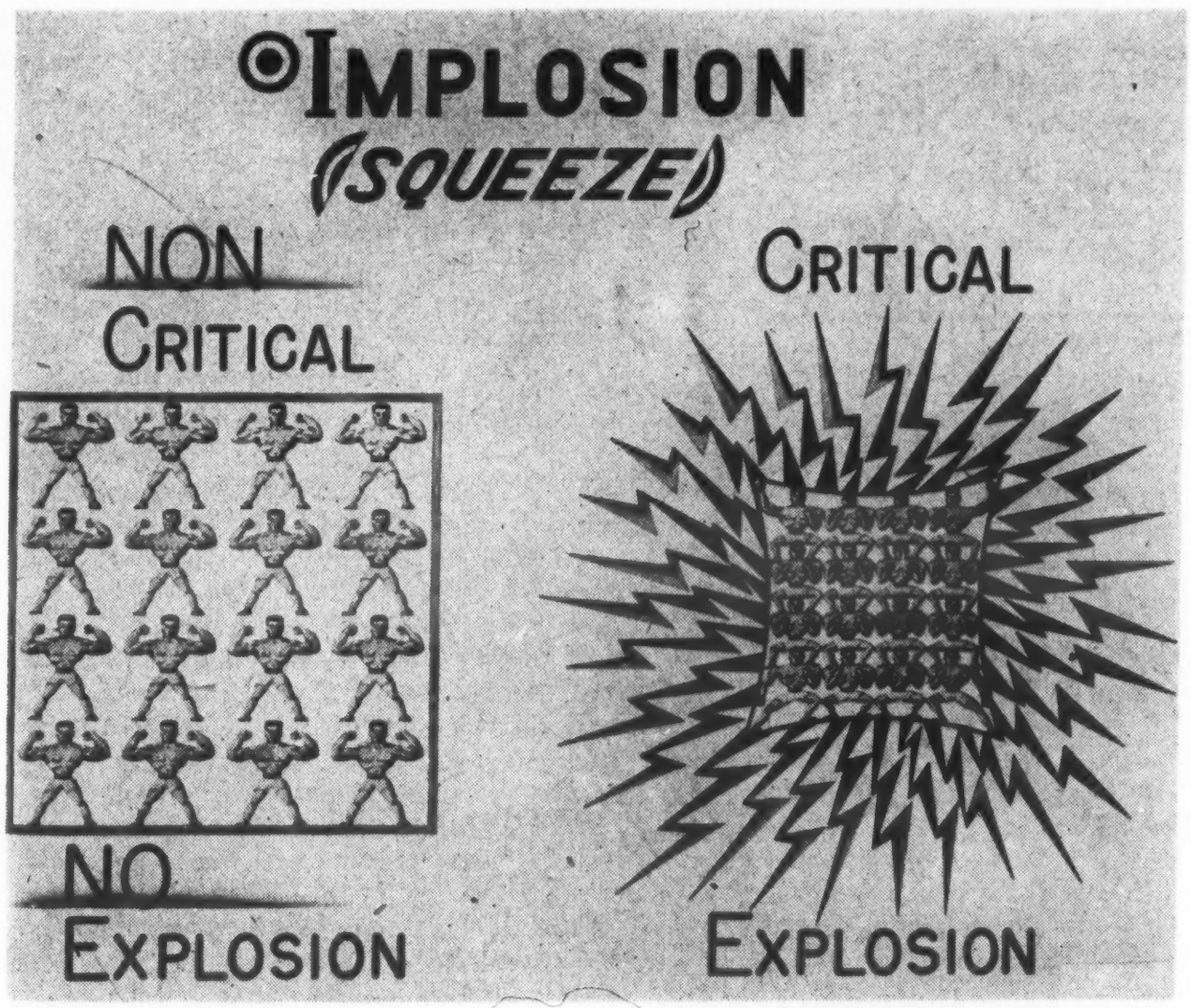
Fig. 3. Atomic blast devastation destroyed Japanese buildings and charred telephone poles, 1½ miles from center of explosion.

The next "damager" of structures is fire, and as we know probably the greatest destruction done to towns or equipment in the last war was because of fire. There were two types of fires. The primary fires were caused when an inflammable building saw this white hot "A"-Bomb fireball and burst into flames. Then we have the second indirect nature, as the blast comes down, knocks over the building, opens the gas jet and we have an explosion. The blast breaks the electric wires and we have a short circuit which starts a fire. The dear wife is standing in the kitchen with her burners going, and after the blast, the fire from the stove is spread to the curtains or the wooden frame kitchen. The problem of fire is a great one and most certainly could be simplified if someone (This Means You!) would put the fires out. However, in Japan our problem was complicated by the following things. The fire engines and fire departments were completely knocked out. The blast damaged the water system to the extent that there were 70,000 breaks in it, and consequently no water pressure. These were above-ground outlets as no major underground pipes were badly damaged. Finally the Japanese people were apathetic. With all these things—no fire department—no water—no people willing or mentally desirous of putting out the fire—it goes out of hand. A fire storm, the term truly stating what it is, made the entire town or area a holocaust.

We can now see what this would do to the signal center of our town or military area. Within a mile and a half from the bomb, communication centers would be out (Figure 3). The cable, wire, radio antennas, etc., above the ground would be badly damaged to two miles (Figure 4). The nerve center which will control the defense organization is destroyed. With lead and rubber cable melted, operation personnel would not be able to repair the damage to their communication equipment themselves. Certainly the repair and maintenance facilities, within a two mile radius, would be incapable, without planning, of causing a continuous flow of repaired material into the civilian or military organization. This may necessitate certainly, extra channels, by-passes, and communication equipment of a mobile nature which could be moved into the area. The military being mobile, has the advantage, although the extensiveness of our average civilian communication set-up allows a greater allowable density of destruction before the nerve system is over-taxed and becomes useless. We think, with planning, both communication systems can withstand the shock of the bomb in the specific area by either the extensive coverage or mobility of coverage.

Let's take a minute, now, to discuss *You*. What happens at a mile or two miles? The effects can best be described under four headings which killed or injured approximately 200,000 people in Japan. The two major causes of death were blast and burn, accounting for 85% of the dead. About 15% of the people were killed from the third cause, radiation. Although we don't be-

Fig. 2.



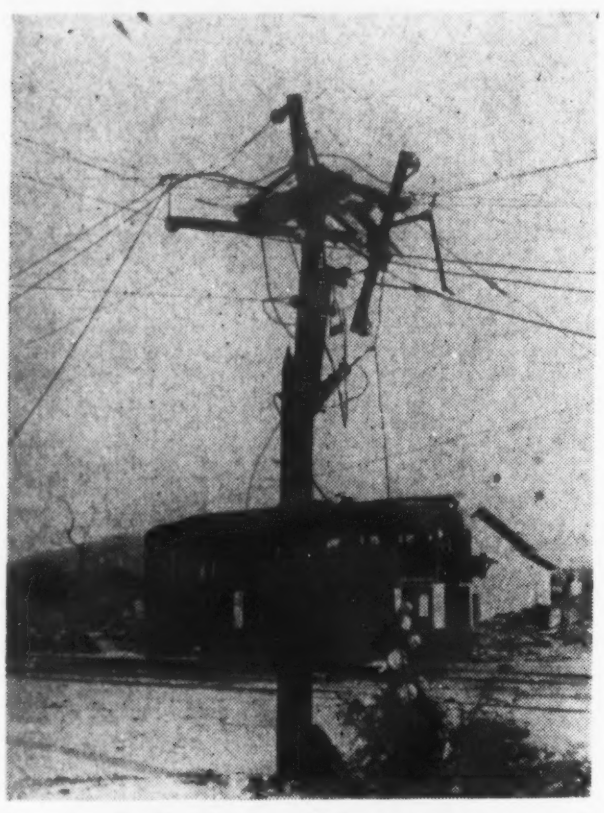


Fig. 4. Badly damaged Japanese communications equipment. Buildings in rear were re-built after A-bomb explosion.

lieve many were killed from the fourth cause in Japan in our American way today perhaps the psychological or panic effect will cause the death of more than all the other three combined, i.e., blast, burn and radiation.

Getting back to blast, we humans, although frail in body structure, can stand an awful lot of body pressure before we are killed by the blast nature of this weapon. The pressures that will kill us by concussion from its blast action are of the order of over 100 pounds per square inch, and are not felt on the ground after the bomb explodes. However, the high winds caused by the blast wave made derbis fly in all directions, either in the civilian or military areas, causing lacerations, bruises, breaks and decapitations, better known as *Mechanical Injury*, from debris coming toward us at speeds of 100 to 300 miles an hour. It begins to bring to mind the philosophy of what we can do about this bomb hazard. It is brought out in our title. The answer is to "*Duck*" as soon as possible and *Not Watch* this God-awful awesome sight.

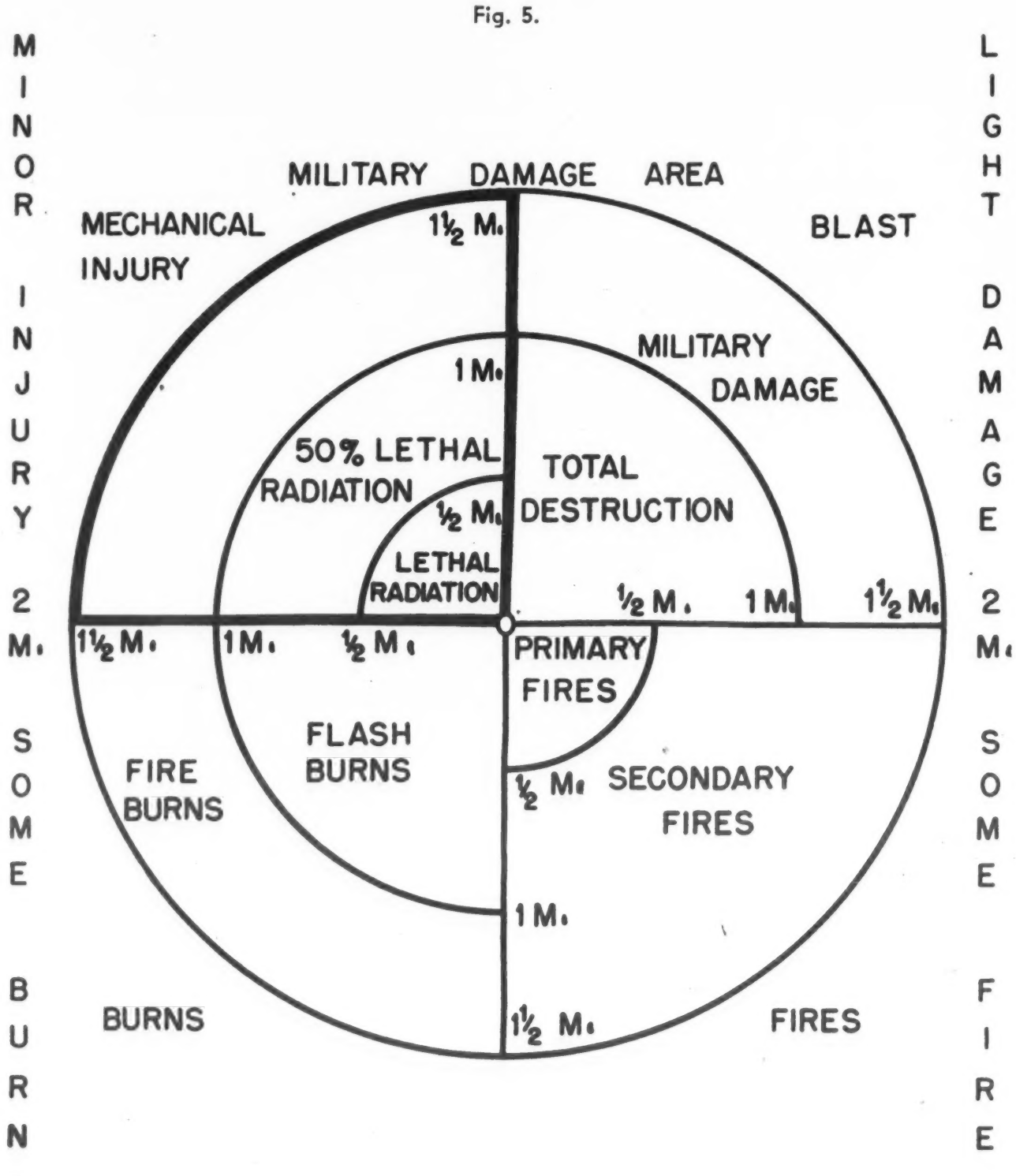
As for *Burn*, it comes either from the flash, where your skin sees the million degrees of temperature or from the fire storm that ensues. You obtain a burn of intensity and extensiveness such that you are generally incapacitated out to two miles in the open. Unless we are "English Purists," we can state that basically no one ever died from only a burn, but from the lack of care of the burn. The problem of caring for thousands of badly burned patients at once is staggering to even the largest hospital facility of a nation. I am sure you know that Boston, Chicago, San Francisco or Honolulu are all good medical cities with well-staffed hospitals furnished with the latest equipment. Apropos, the Coconut Grove fire in Boston a few years back, where a few hundred third degree burn (destruction of skin) patients were taken from the fire. This incident over-taxed the medical facilities of the city of Boston where fire and blast had not damaged a single hospital or hurt a single doctor. In Nagasaki of the 45 hospitals, 3 might have operated after the weapon went off. Of the 200 doctors, 10 were effective. Of the 1600 to 1700 nurses, about 100 were ready for duty. The problem is a great one and the answer to this problem is "*Duck.*" If we put earth between us and this weapon going off, it will stop the flash burn as our clothes stop the flash heat at a reasonable distance from the bomb (three quarters of a mile).

Let's talk about radiation for a minute. When the weapon goes off in the air, significant radiation comes only from gamma (X-ray) since the ranges of "hunks" of helium (Alpha), electrons (Beta), and neutrons are less than the altitude of our detonation which gives us the most effective damage area. The gamma rays are electro-magnetic waves emitting from our fireball, 50% of them hitting the target in 1 second, the rest in the next 89 seconds so that the greater radiation danger is over in 90 seconds for the air burst weapon. This will allow you as a rescue man, either military or civilian, or as a communicator to enter the area immediately and do your necessary work as far as radiation is concerned. The bodies will not re-radiate, the walls will not re-radiate, and those that have received a lethal dose of X-rays (gamma) will not re-radiate. Here is a little formula we must remember. 1 inch of steel, 3 inches of concrete and 5 inches of dirt reduce the effect 50%. We know that the lethal dose as read in the units of radiation called Roentgens is approximately 600. Therefore the formula means that if the source of radiation at a half mile from the weapons is enough to kill you, at the same distance, 5 inches of dirt between you and this source of radiation reduces the units to 300. 10 inches of dirt reduces the radiation to 150 units. 15 inches of dirt reduces the radiation to a point where the doctor cannot even detect biological changes in your body. If we get this amount of dirt between us and the weapon going off, in one second we do not receive 50% of the radiation. What is the answer to radiation? "*Duck!!*"

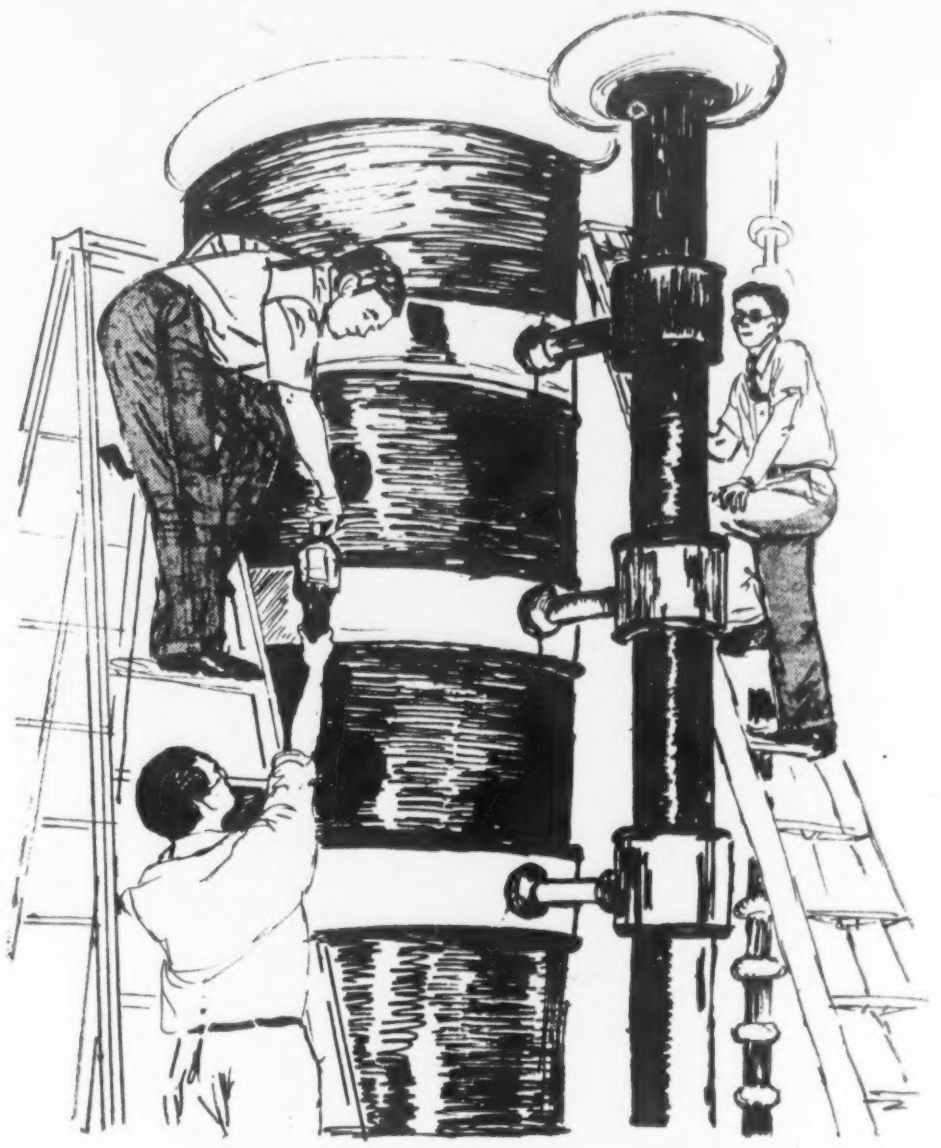
We have said "*Duck*" many times and by it we mean let's fall to the ground. Get as much material between

(*Continued on page 76, col. 1*)

Fig. 5.



THE U.S. NAVAL RESEARCH LABORATORY



From The Director

Because the art of warfare, and particularly of naval warfare grows to depend more and more upon the application of new knowledge in almost every scientific field, the results of research and development sometimes affect naval efficiency in astonishing ways. Since the technical strength of the Navy is dependent upon its scientific well-being, work at the Naval Research Laboratory (NRL) naturally is selected chiefly on the basis of specific naval interest.

Fortunately, intensive research and development, pursued with immediate Navy needs in mind, usually turns up unexpected practical benefits appreciated soon or late by us all. No one now doubts that past emphasis on so-called "military" research has contributed brilliantly to countless presentday aspects of everyday living. Investigations in progress today will yield further developments not only useful for the naval defense of America but of distinct benefit in routine matters of peace.

It is impossible, within a few pages, to describe adequately a scientific institution of the size and character of NRL. The intent here is only to highlight principal milestones in the Laboratory's history, to record some past accomplishments, and to point up likely opportunities for future service.

Captain F. R. Furth, USN

A Short History:

For more than twenty-five years the Naval Research Laboratory has been occupying a place of progressively greater responsibility in U. S. Navy affairs, its broad objective being always, as originally defined, to increase the safety, reliability, and efficiency of the Fleet by the application of scientific experimentation to naval problems. In the course of steady growth from a modest five building laboratory to one of the largest research units in the Navy, NRL has been a pioneer in hundreds of developments—in communications, in detection and ranging, in guided missiles, in underwater sound gear. in naval applications of physical optics, in antifouling paints, in rain-repellent films, in hydraulic fluids and lubricants, in fire-fighting equipments-now accepted quite ordinarily in both military and civilian circles. Continually growing demands on the part of the service have necessitated periodic expansion of the facility so that the plant is now well equipped to conduct research and engineering development in any field of physical science.

That most of the expansion to present size and importance took place during the period 1940-45 provides some measure of the responsibility of NRL in the conduct of World War II. But as an institution, the Laboratory owes its origin to the foresight and initiative largely of two men. As early as 1910, Thomas A. Edison recognized the need for a research organization dedicated to the interests of the Navy, and by 1915 certain of his public statements on this matter had come to the attention of Josephus Daniels, then Navy Secretary.

In July of the latter year, Daniels wrote Mr. Edison stating his intention to establish a department of invention and development and asking whether he, Edison, as a public service, would be willing to act as chairman of a board of consultants. Acceptance of this post by Mr. Edison led shortly thereafter to the establishment of the Naval Consulting Board composed of representatives of the eleven largest technical societies in the United States and including a number of distinguished scientists and administrators like Leo Baekeland and Franklin D. Roosevelt.

Armed with the recommendations of the consulting board, Daniels took the matter before Congress, and in 1916 the House passed an appropriation of $1,000,000 for the construction of the first laboratory buildings and $500,000 for the initial year of operation. Because of the unusual situation arising from World War I however, formal opening of the new facility was delayed until July 2, 1923.

During its first quarter-century NRL has operated variously as an independent office under the Secretary of the Navy, as a part of the old Bureau of Engineering, and, during the last war, as a field activity of the Bureau of Ships. Early in 1945, a merger toward an all-Navy scientific organization, NRL was transferred to the Office of Research and Inventions, now the Office of Naval Research. But regardless of these changes in cognizance the Laboratory has tackled technical problems for all of the navy bureaus.

The internal organization of NRL has always followed the pattern conceived originally by the Navy Consulting Board —that of a laboratory staffed by civilian scientists, under Navy management, devoted to the scientific interests of the Navy. The higher administrative and liaison posts are filled by Naval officers chosen for their engineering or scientific background. Naval personnel serve tours of duty of two to four years so that outgoing officers carry back to the fleets a definitive experience with the scientific method. Similarly, the replacement officers coming directly from the fleets bring to the Laboratory the immediate problems and operating experience of the service afloat, under water. and in the air.

The civilian scientific organization, on the other hand, is permanent and is afforded full authority and responsibility for the conduct of its work. Each of the twelve research divisions operates under a civilian-scientist superintendent. Coordinated by a civilian Director of Research the divisions are subdivided into branches each dealing with some definite type of scientific problem.

That this combination of officer and civilian control has functioned harmoniously and effectively is evidenced by NRL's achievements over the years. Today the Laboratory is

Left: Aerial view of present U. S. Naval Research Laboratory, Washington, D. C.

Below: First laboratory buildings in the initial year of operations—1923

conducting large programs of basic investigation to open new areas for development. It looks forward to continued success in adding to the scientific stock of the Nation.

Research Facilities:

NRL's numerous permanent and temporary buildings, all of harmonious external appearance and distributed around a landscaped mall are specially designed to meet definite requirements. Laboratory buildings which are in the majority, are so constructed that space may be added to or subtracted from individual rooms by means of demountable bulkheads. Since the Laboratory is conveniently situated on tidewater, a wharf is also provided to accommodate small vessels up to 24-foot draft, and a converted patrol craft is assigned permanently for test work afloat. For more extensive testing over long ranges or in open waters, use is made of the Chesapeake Bay Annex, NRL's field-test station 40 miles from Washington on the western shore of Maryland at Randle Cliff.

Laboratory equipment is of the very finest. Among pieces of particular interest are a 5-Mev (million electron volts) proton-accelerating Van de Graaff generator; a 20-Mev betatron; an electron microscope; two automatic computers for use in complex mathematical problems; cryogenics equipment for investigations at temperatures of a few thousandths of a degree absolute; and altitude chambers which simulate changes in pressure, temperature, and humidity experienced by aviators.

Whenever highly specialized apparatus are unobtainable on the open market they are designed and built within the Laboratory itself. Complete shop facilities make possible every step-blue-print to finished products—in the construction of almost any kind of equipment required by members of the scientific staff. Represented among the service facilities are most skilled crafts useful to the scientific and engineering professions.

An outstanding technical library—embracing 30,000 books, 600 foreign and domestic periodicals, and 100,000 reports—provides ready reference. A translator and several reference librarians are available to assist in preparing bibliographies or in the searching of the literature. A weekly Library Bulletin informs the staff of new library material, including the contents of current periodicals, and semi-weekly Documents Bulletin furnishes abstracts of technical reports relating to the individual research problems. Also available are scientific editorial services and facilities for illustrating and publishing technical reports or for preparing technical papers for scientific meetings or the professional press.

A matter of special importance in research and development is that of property rights and patents. The Patents Branch at NRL concerns itself with securing protection for new devices invented by scientists employed at the Laboratory.

NRL At Work:

Because of its long intense prosecution of the theory and application of high-frequency directional radio, the Naval Research Laboratory has sometimes been dubbed the "Father of American Radar." But the work of the Laboratory is far from restricted to this single field. Several hundred NRL scientists are now at work on board research programs involving all the major branches of physical science. Naturally, the pursuit of extensions and improvements in all aspects of electronics continues apace but the Laboratory's program of investigation, now more than ever before, embraces numerous comprehensive projects designed to augment man's knowledge of the universe about him.

Possibly the most intriguing program undertaken since World War II has been that dealing with exploration of the upper atmosphere by means of research rockets. In the flight of over a dozen German V-2's, NRL has been responsible for instrumentation, and Laboratory personnel are now conducting experiments with the Viking, a type of rocket designed and built under NRL contract. The Viking rocket has established a new world's altitude record for single-stage rockets of 135 miles. Thus being accumulated is a large mass of new data on conditions in the earth's. outer atmosphere and on cosmic radiation (most powerful energy source known, not yet duplicated on earth) heretofore inaccessible to us. To collect information by remote control from the ground, NRL scientists have devised new techniques and new instruments for use in these "airborne laboratories." A related program for gathering data from outer space is

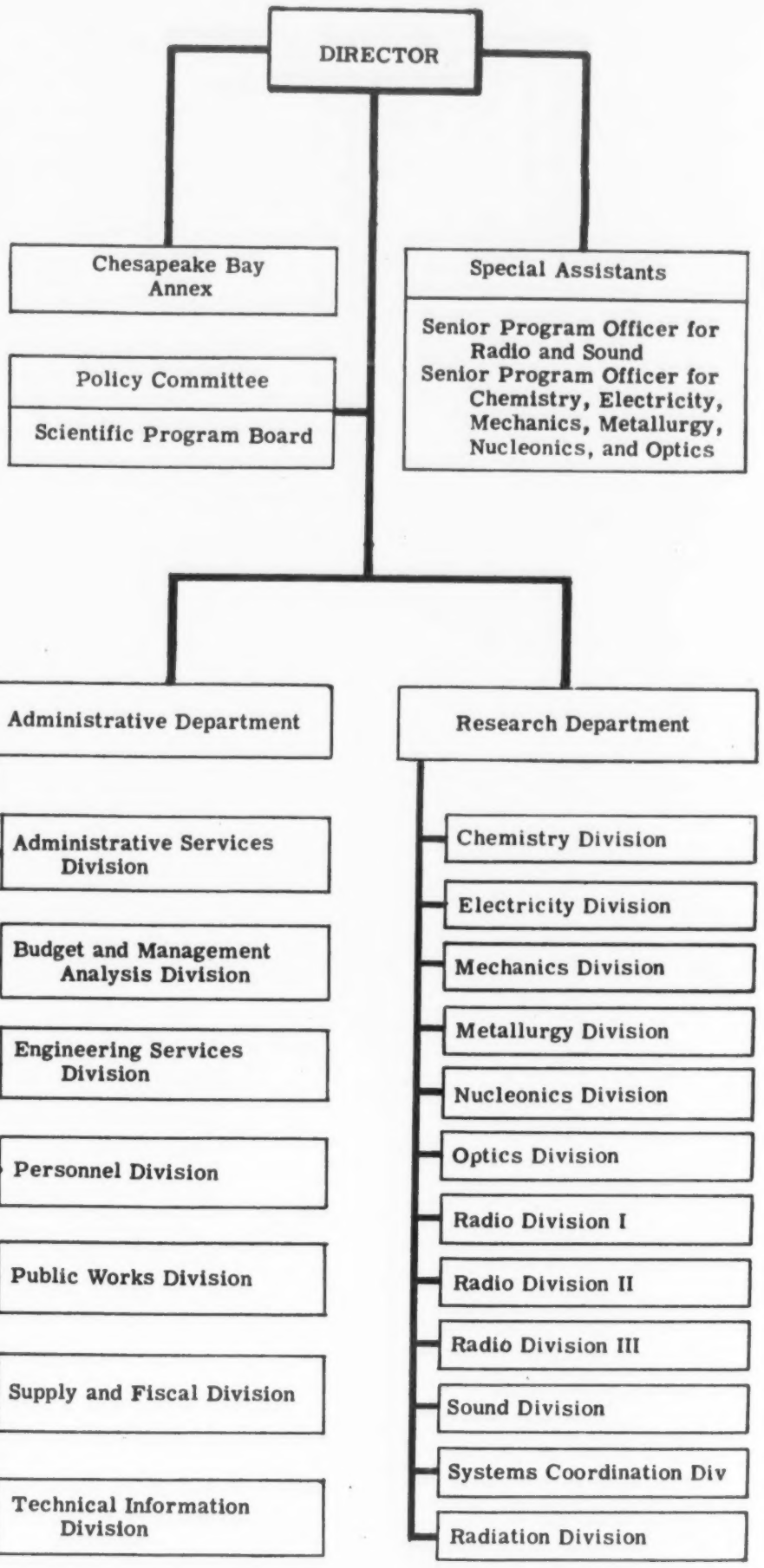
50-foot dish at the Naval Research Lab, the "eye" of an elaborate "radio telescope" for examining solar emissions.

that in the relatively new science of "radio astronomy," which seeks to study the invisible portion of the sun's spectrum (electro-magnetic radiation of the order of thousands of megacycles). At NRL the usual radar antennas typical of an electronics laboratory are dwarfed by the newly installed 50-foot dish, the "eye" of an elaborate "radio telescope" for examining solar emissions heretofore little understood but known to influence weather and radio communication on earth.

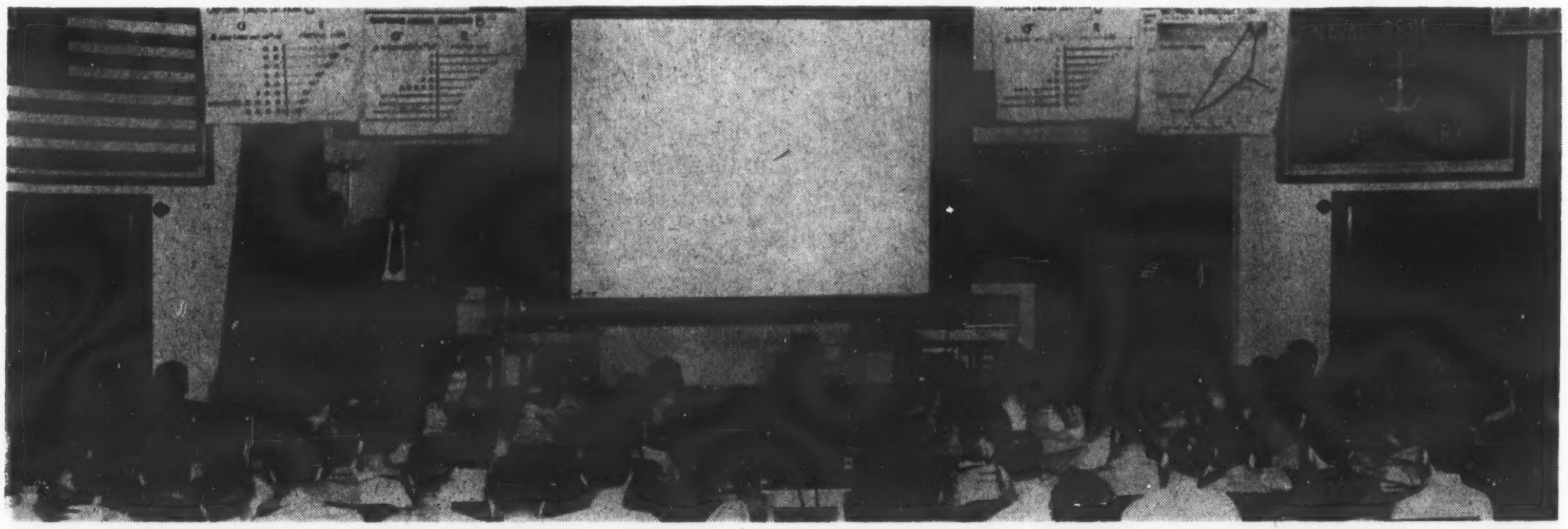
In connection with the development of improved and higherflying planes and rockets the Laboratory is presently concerned with basic studies in the crystalline structure of metals and alloys aimed at the development of high- temperature-resistant materials for gas turbines and jet engines. And one group is analyzing mathematically the effect of shock vibration, and other stresses on the endurance of such new materials.

Work in mechanics is chiefly on dynamic processes such as initiation of plastic flow, transition to brittle rupture, ballistic penetration, and progressive failure under severe

NRL Organization



A comprehensive training program at the Naval Research Laboratory is available for self-betterment.



cyclic strain. Melting, casting, and welding of metals is the subject of study in metallurgy toward special alloys for armour and ship plate.

A special problem long challenging physicists has revolved about the anomalous behavior of matter at or very near absolute zero, the temperature at which, according to kinetic theory, all molecular motion ceases. A project in cryogenics, the study of extremely low temperatures, has resulted in the design of equipment to provide temperatures of the order of 0.001 degree absolute. Now under construction, the equipment when complete will constitute a facility unique in America for low-temperature research.

Improving methods of underwater communications—developing underwater sound (sonar) systems at NRL.

NRL Research Department

Director of Research

- **Chemistry**: Electrochemistry; Engineering Research; High Polymers; Lubrication; Physical and Inorganic; Protective Chemistry; Protective Coatings
- **Electricity**: Airborne Systems; Cryogenics; Electromagnetics; Operational Equipment; Shipboard Systems
- **Mechanics**: Aerology; Applied Mathematics; Ballistics; Shock and Vibration; Structures; Thermodynamics
- **Metallurgy**: Analytical Chemistry; Crystals; Electric and Magnetic Alloys; Ferrous Alloys; High-Temperature Alloys; Metal Processing; Nonferrous Alloys
- **Nucleonics**: Accelerators; Heavy Particles; Light Particles; Special Instruments; Special Research; Theory
- **Optics**: Applied Optics; Electron Optics; Micron Waves; Photometry; Radiometry
- **Radio I**: Absorbent Materials for Radio Waves; Antennas; R-F Research; Rocket Sonde Research; Security Systems; Vacuum Tubes; Wave Propagation
- **Radio II**: Communications; Countermeasures; Radio Techniques; Search Radar; Systems Utilization
- **Radio III**: Avigation; Equipment Research; Operational Research; Psychology; Radar I; Radar II; Special Research
- **Sound**: Electronics; Propagation; Sonar Systems; Transducers
- **Systems Coordination**: Assigned Projects; Information Collection; Procedures and Methods; Services
- **Radiation**: Analysis; Particles; Atomics; Reactions; Recording; Measurements; Instrumentation; Propagation

In one of many chemical projects, the whole theory of friction and wear is being reinvestigated as a new point of departure in the development of improved lubricants, especially to meet the rigorous requirements of jet engines. Much of what is now known of surface chemistry and physics of monolayers generally is indeed the product of relatively recent work by NRL people.

Other work in chemistry is concerned with improvements in high-energy fuels, with protective coatings for men and material, with power generation, with rubbers and other elastomers, for special applications with electrical insulants, and with new techniques in fire extinguishment by foams.

In nucleonics, the Laboratory's program has been directed toward development of new and more effective particle accelerators and simultaneously, toward investigation of cosmic rays using stratospheric balloons.

Airport illumination and related problems in the transmission of light come in for attention by several groups. Others are working on antennas, on vacuum tubes, on improved electronic components of every description, and on the basic mechanism of electromagnetic propagation. Still others are occupied with improving methods of underwater communication. The Laboratory is, as a matter of fact, the prime agency of the Navy for development of underwater sound (sonar) systems.

A distinguishing feature of NRL has always been its freedom from scientific superficiality. No model of fashion, its buildings may by present day standards seem antiquated, its laboratories colorless. But for tools of the trade and sheer human ingenuity, the Naval Research Laboratory has never been wanting. To a research organization nothing is more essential than these elements of progress.

Speaking of Professionalism:

Opportunities for professional development abound at NRL. Members of the scientific staff are encouraged to contribute to the professional journals and to participate in professional meetings. The Laboratory itself acts as host for many technical symposia of national scope; and seminars are of more or less regular occurrence with lectures by NRL scientists or by visitors, sometimes from abroad.

By special arrangement with several local universities, a comprehensive training program is available for self-betterment. Regular academic credit is offered for courses taken at the Laboratory, and some research carried out at NRL is accepted as work leading to advanced degrees.

New Efficiency for Signal Field Units

mobility ●

flexibility ●

compactness ●

By Cpl. Joe McLean

Mobility, Flexibility , and Compactness are the three key accomplishments in recent rapid strides made in Korea by the telephone and teletype company of the 51st Signal Battalion to bring I Corps communications to an even heigher level of efficiency.

Mobility—To be able to move the vast network of corps communications and establish it in a new command post area within a matter of a few hours. *Flexibility*—To meet and to be able to replace lost or destroyed units without delay and to furnish a volume of communications far exceeding that of a corps headquarters on World War II. *Compactness*—To centralize as many units as possible to the point, where operative personnel can handle the equipment with a minimum of maintenance and duplication of effort.

These increased needs had posed a challenge to the officers and men of the company as they operated communications for I Corps Headquarters from Taegu, South Korea to Anju, North Korea. New command posts were wired 23 times in a period of seven months and finally the corps headquarters settled down in one spot in the middle of May.

Officers and men of the company, commanded by Captain Walter G. Schmidt, at last had time to sit down and discuss their ideas. In August, construction was begun in the company which was to modify nearly every phase of the company's activities.

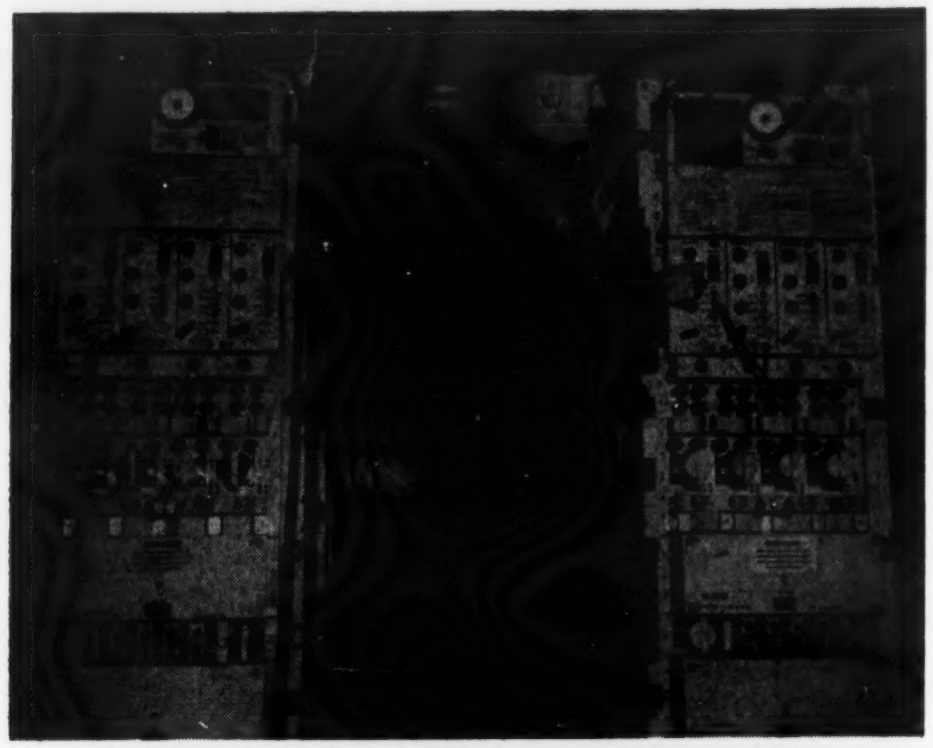
The "nerve center" of the 51st, the wire chief's office, came in for early attention. With the wire testing apparatus for the T and T company and the Ts 27 slidewire dial testing unit, located in the wire chief's office, it is imperative for the office to be in constant operation.

Aside from locating wire line breaks, instructions are issued to construction companies from this office. In the tent that had been used before, the wiring of the office and the transfering of records took three or four hours to install. The new office, now in a van, requires 10 minutes to be in operation in a new area.

All wiring and record cabinets, a BD 91 switchboard with direct lines to each of the three construction companies of the battalion and ten test leads to the main switchboard are also built into the wire chief's new rolling office.

Compactness prompted the next construction job of the T and T company. The main distributing frame and the switchboard had been mounted in two separate vans since the batttalion landed in Korea. T and T company personnel noticed that constant disconnecting and connecting of the cables between the switchboard and the frame were breaking strands inside the rubber insulation of the cable. Each time the switchboard and the frame were set up, 400 points had to be joined. Four hours were required to connect the points and put the switchboard in operation.

After putting their heads together, wire chiefs and crewmen under First Lieutenant Charles K. Handfield, and Master Sergeant Henry A. Queen decided to consolidate the switchboard and frame in one van. Under the new arrangement, the cables would never have to be disconnected and the van could be driven into place, receive trunk and local lines, and be ready for operation within half an hour. Eighty



Above: Mobile carrier van, M/Sgt. B. M. Stout, carrier trick chief, makes a bay adjustment on the T and T Company's mobile carrier van. Below: Interior view of front compartment of the company's switchboard-frame.

trunk lines and 98 locals are handled by the combination frame-switchboard van. The capacity of the van is 90 trunk lines.

A conference on the company's carrier units brought prompt action from Sergeant Harry C. Thompson, Sergeant Bryce W. Stout, Sergeant George Gardner, and Sergeant Alfred H. Bergman. Two different types of stations were constructed under the supervision of the carrier "trick" chiefs. A semi-permanent installation was located in a combined squad and small wall tent.

Dust—a major menace—was eliminated by laying a wooden floor down. The second carrier station was mounted

in a van and was kept ready at all times for jump teams to use on moves.

The semi-permanent carrier station includes two features standard to permanent installations which are being used for the first time in the field. A trunk intermediate distributing frame (TIDF) in the same quarters as the bays and ringers, was designed and built by Sergeants Thompson, Stout, Gardner, and Bergman.

By an adjustment on the frame, the carrier chief on duty can switch a broken land line circuit to very high frequency radio, connect channels to other bays, connect channels to other channels and ringers to channels without ever leaving the TIDF. The adjustments can be made by personnel familiar with the frame in the time it takes to switch two wires. Switchboard pen-stips were used to construct the frame, which was built in 15 hours.

Another improvement in the semi-permanent carrier station was the construction of racks for the ringers. Previously the ringers were arranged four deep in the station. When a ringer was found to be out of order, all of the ringers in the stack had to be disconnected in order to remove the faulty unit.

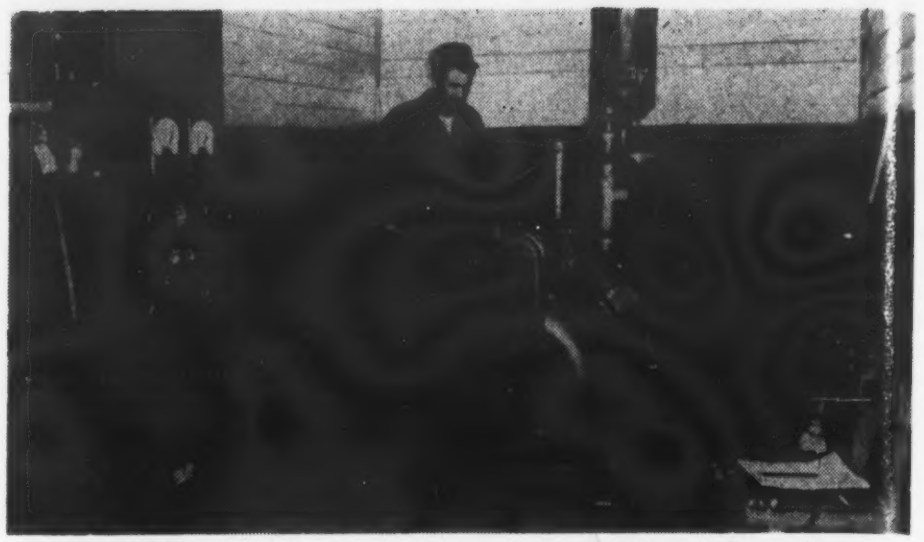
With the racks installed, the faulty ringer can be removed rapidly without disturbing the operation of the other three ringers.

Seventy five trunk circuits, 7 duplex teletype circuits, two half duplex teletype circuits, one radio teletype full duplex circuit, and eight very high frequency radio (five operative and three standby) circuits are being handled in the new carrier station.

The mobile carrier van was constructed right in the company area from the base of a standard 10 ton trailer. The van, which holds sixteen bays and 24 ringers, has all of the equipment bolted down to prevent harmful vibration.

The evolution of the power set-up in the company alone is a full story. When the battalion first arrived in Korea, all of the power for the communications center, switchboard, and the teletype lighting came from PE 75 and PE 95 generators. The PE 75's (2½ kilowatts) and the PE 95's

Trunk intermediate distributing frame, a radical improvement in the T and T company's carrier station. By switching wires from one side of the frame to the other any changeovers in the station can be effcted.



Power station technician examines newest piece of equipment in the power section, a PE 205 B generator. Duplicate generator is located at opposite end of ten-ton trailer which houses the unit. The two generators supply all signal power.

(10 kilowatts) were operated by members of individual sections in addition to other duties.[1] Maintenance problems increased rapidly with inexperienced personnel in charge of the generators.

In March, a policy of consolidating all of the generators into one power section was decided on by company authorities with Captain James B. Warburton, to be in charge of the new section. All of the 75's and 95's were banked in one group; The 95's supplying the operating power and 75's being used for standby purposes.

Soon, new difficulties were being encountered by Captain Warburton. Values on the small generators were being worn by the terrific strain of the increased load and had to be disassembled at the rate of two generators a week for repair.

Twenty minutes of power failure occured every day because of the maintenance required by the small generators. Captain Warburton procured two abandoned civilian units, a 30 kilowatt diesel, and a 25 kilowatt Lorey unit, and began work on the new units. It was necessary for power crews to overhaul both units and completely rewire one of the generators.

The new generators were mounted on engineer pole trailers in the middle of May and began operation. In five months time since May, the company had had only 17 minutes of power failure with the longest continuous failure being four minutes. The company recently obtained authorization for two PE 205 units (15 kilowatts), the standard generator for radar. The new units are mounted in an enclosed trailer, complete with built-in switchgears mounted on rubber springs to absorb the jolts of Korean roads. The van is engineered so that it can go into operation in a new area by merely dropping three wires for connection to signal communications facilities.

The PE 205 B's will go into a standby status as soon as the two civilian Leroy generators can be housed in a similiar van. The T and T company is ready for emergencies caused by destruction or enemy action. A separate I Corps command post has been wired and is tested daily. A duplicate power unit, switchboard, and carrier are on hand to replace the operational units in case of aerial attack. The switchboard can go into operation as soon as operators take their places at the board.

The initial table of organization and equipment proved insufficient to provide communication I Corps and its units.

Switchboard operators, for instance, had to be increased 300 percent to handle the volume of calls, sometimes reaching a peak of 600 calls per minute, through the corps board. At the present time, according to Sergeant First Class Chester R. Bolton, chief operator, operators work an eight hours shift, being alternated every hour for a brief rest period.

T and T personnel emphasize that the recent improvements are not unusual for permanent stations. However, they claim that this is the first time these features have been applied to a field unit with mobility, flexibility, and compactness carried out in every phase of operation.

SIGNAL ECONOMY in the BATTLEFIELD

Reclamation operations have made available for reuse, tons of long-range, permanent cable and field wire.

The voices of war, stilled when the battle pushed beyond their speaking range, in Korea, are now able to talk another day.

The battlefields are being cleared of old telephone wire and the backbreaking work in the mine-strewn rice paddies and up the mountain slopes in recovering, reclaiming and salvaging communications lines used in countless battles is paying off.

In X Corps, spread out over 2,000 miles of some of the world's toughest terrain, the wire reclamation operations in recent months have:

1. Saved upwards of $2 million to American taxpayers.
2. Made immediately available for re-use thousands of tons of long-range, permanent cable and field wire.
3. Salvaged hundreds of tons of copper for melting and re-use.

The quantity of long-range cable (spiral-4) recovered and made available again for signal operations comes to more than $1 million in value and is still coming in to the reclamation "factory" set up by the 4th Signal Battalion of X Corps. Spiral-4 costs $171.50 per reel.

Another $1 million saving has been effected in the recovery of 17,627 miles of field wire, 20 per cent of which has been locally reclaimed and put back into immediate use. The remainder has been shipped to Pusan, the port of Korea, and thence to Japan for rehabilitation or salvage.

Field wire is used for telephone, telegraph, and teletype lines, with a lighter weight field wire employed in assault tactics in the most forward areas.

The wire reclamation program began only after the military situation had become stabilized enough to permit the collection of used lines.

The successful drive was launched in April of 1951, but after the battle of the Punch Bowl, Colonel Henry Hort,[1] X Corps signal officer, called for an even greater effort to clean up the combat sector.

Normal operations had seen reclaimed wire rolling in at an average of 5 tons of field wire per week since spring. But as the program was accelerated, the net for the mid-October - mid-November period added 7,382 miles of wire to the salvage bunk.

A sizable quantity of wire has been collected by South Korean Army troops, and this is being turned over to Korean police authorities for use in the rehabilitation of communications lines in war-torn peninsula towns.

The wire recovery program began last spring at Checon where extensive wire installations had been made prior to the Battle of the Soyang River. After the enemy had been shoved reeling backward into North Korea, wire recovery was intensified. In October and November, after the battles of Bloody Ridge, Heartbreak Ridge, and the Punch Bowl, the collection hit its peak. The entire X Corps area was combed for wire. According to Army communications men who served in World War II, wire recovery never approached the intensity it has reached in Korea. This can be credited to the Army's persistent economy program, plus the tremendous demand for wire caused by the highly fluid type of Korean warfare which existed before the front was stabilized.

"The biggest problem we had in launching the wire-recovery plan was in trying to make the soldier realize there was so much to be gained from it," said Captain Richard S. Bush, an assistant to Colonel Hort. "Once the troops saw the savings in both material and money that was being made, the drive gathered speed."

On specific instructions from former X Corps commander Maj. General Clovis E. Byers in October, signalmen assigned to stringing wire were also detailed to recover the same lines. Not only were they familiar with the areas they had wired, but they began laying lines with keen discretion, eliminating all waste.

"The change was noticeable at once," said Captain Bush, who recalled that less wire was being ordered by units as a direct result of the dual role of the wire layers.

Recovering wire has not been without its grim note, however. There is a strong element of hazard because many areas still contain undetected mines.

Teams working in known mine fields are guided by map overlays obtained from the engineers. The engineers are called in when mine detection and mine removal are necessary. As a result, casualties are few and far between.

Wire is recovered by 11-man teams working under supervision of a chief, usually a sergeant. Each team is allocated an area to clean up as the military situation permits.

Most of the weather-proof cable recovered in the X Corps combat zone has been brought in by the 4th Signal Battalion,[2] which has served with X Corps since the Inchon invasion in September 1950. The battalion alone has reclaimed 4,241 reels of cable in its wire "factory." This "factory," with its crude but ingenious machinery, for sheer production would put to shame many a commercial plant.

The communications men in each unit do the "clean-up" for the area it occupies, beginning at the front lines, and working back to the rear of the unit. Thus, no area is skipped, and a thorough job is assured. It's part of the front line "police-up."

In addition to recovering the wire, the teams have been collecting hundreds of telephone poles and returning them to stocks for re-use. These poles were cut from trees high on the mountain ridges, cleared of bark and branches by native Korean labor, and transported to the communications routes leading to the battle lines. Every effort has been made to string the wires overhead to preserve their efficiency and protect them from ground dampness and traffic.

[1] Former president of the AFCA Augusta-Camp Gordon Chapter, when that organization won the AFCA's "Chapter of the Year" title in the 1950 contest. At that time Col. Hort was commanding officer of the unit training group, Signal Corps Training Center, Camp Gordon.

[2] See "One If By Land," SIGNAL, Nov-Dec 1951.

The most dramatic picture of World War II, and one of the outstanding pictures of all time, is Joe Rosenthal's immortal Graphic shot of U. S. Marines raising the stars and stripes on Mt. Suribachi, Iwo Jima.

GRAFLEX

It seems odd that so many of the world's history-making photographs stem from the relationship of a bicycle to a camera. And yet it is so. Away back in 1890 when bicycles, not automobiles, were a popular means of conveyance, two men, William Folmer and William Schwing got together and founded the Folmer & Schwing Manufacturing Company in New York City. Their business was to manufacture such widely diversified products as gas lamps, bicycles and cameras. Did I say diversified? Then I am wrong—at least insofar as the thinking of these two men was concerned. Their idea was to use bicycles to sell cameras and vice versa.

In those days, anyone who wanted to take pictures in the country either went on foot, by buggy, or more often than not, on a bicycle. The two, bicycle and camera, seemed to go so well together that the first camera made by Folmer & Schwing, called a Cycle Graphic, was designed to hang from a bicycle bar. This probably was the first instance of photographic merchandising ingenuity. Blessed with such imagination, the business became a success. A catalog put out by the company eight years later listed over 22 makes of hand and stand cameras, forerunners of today's modern press and view cameras.

This was the beginning of the company now known as Graflex Inc., whose cameras have been used in every corner of the globe by explorers, scientists, hunters, combat photographers, and war correspondents, as well as amateur and professional photographers. A Graphic camera was used by Colonel Theodore Roosevelt to record his expeditions to South America and Africa. Pictures made by Admiral Byrd on his trips to the South Pole were taken by a Graphic camera. Dr. Richard L. Sutton used a Graphic on his trips to Asia and the Arctic as did Colonel Albert W. Stevens in his history-making stratosphere flights sponsored by the U. S. Army and the National Geographic Society.

Any resemblance between the old Folmer & Schwing manufacturing plant and today's modern Graflex plant is purely coincidental. Production is going forward at a record-breaking pace in the manufacture of civilian and military photographic equipment. Tons of raw material in the form of sheets, tubes, rods, lumber, leather, and plastics pour into the plant at a rate never before seen and come out as cameras and accessories of all kinds. The plant now maintains metal washing, plating and wordworking departments which are considered among the finest in the country. Today Graflex, Inc. stands as a tribute to the vision of Folmer & Schwing, but at one time they must have had serious doubts that photography would ever be more than a casual pastime for tourists and amateur artists.

It required more than a vivid imagination to foresee the tremendous importance photography was to achieve in the dissemination of news. It has become one of the most powerful reader influences ever known. Of the nine largest general circulation magazines, only one found it possible to build and hold that circulation without pictures. Surveys show that pictures out-pull written material by 50% and more in reader interest. In business and various professions, too, photography has provided a means of doing many jobs faster and better. Even such delicate and complicated professions as medicine use the camera to great advantage.

Graflex is proud of its contribution to the rise and development of photography as a means of communication. Think of any of the all time great pictures, check back on it and the odds are better than 90 to 1 that it was taken with a Graflex-made camera. Such immortal pictures as the Iwo Jima flag raising by Joe Rosenthal or the explosion of the huge zepplin Hindenburg and countless others were all made with cameras built by Graflex. In less spectacular but equally important businesses, Graflex equipment has achieved equal prominence.

The Speed Graphic camera, the adopted camera of America's press photographers—undoubtedly responsible for more famous photographs than any other camera made in the world.

The Jones twins, famed for their coverage of the Korean war, compare their Graphic cameras. One is carrying a Speed Graphic, and the other a Combat "45" Graphic.

One of the lesser known facts about Graflex, Inc., or Folmer & Schwing as it was known in those days, is that at one time they were a part of the Eastman Kodak Company. In 1905 the company became the Folmer & Schwing Division of the Eastman Kodak Company. This and another Eastman holding, the Century Division, produced the great bulk of professional cameras sold by Eastman under such trade names as Century, Crown, Cirkut, Graphic, and Graflex. In 1926 the Folmer and Century Division and the Premo line were separated from the Eastman Kokak Company pursuant to a Federal Court decree, and became a wholly independent company, The Folmer Graflex Corporation.

William F. Folmer, the inventor of the Graphic and Graflex Cameras, who had been associated with Kodak as manager of these Divisions, was the first President and General Manager of The Folmer Graflex Corporation. He served until 1927, when he retired because of illness. Nelson L. Whitaker was elected President and General Manager in November 1928. He continued in that capacity until May 1949 when he was elected Chairman of the Board, and Gaylord C. Whitaker was elected President and General Manager. On June 13, 1945, the corporate name of the company was changed from "The Folmer Graflex Corporation" to "Graflex, Inc." to conform to popular usage.

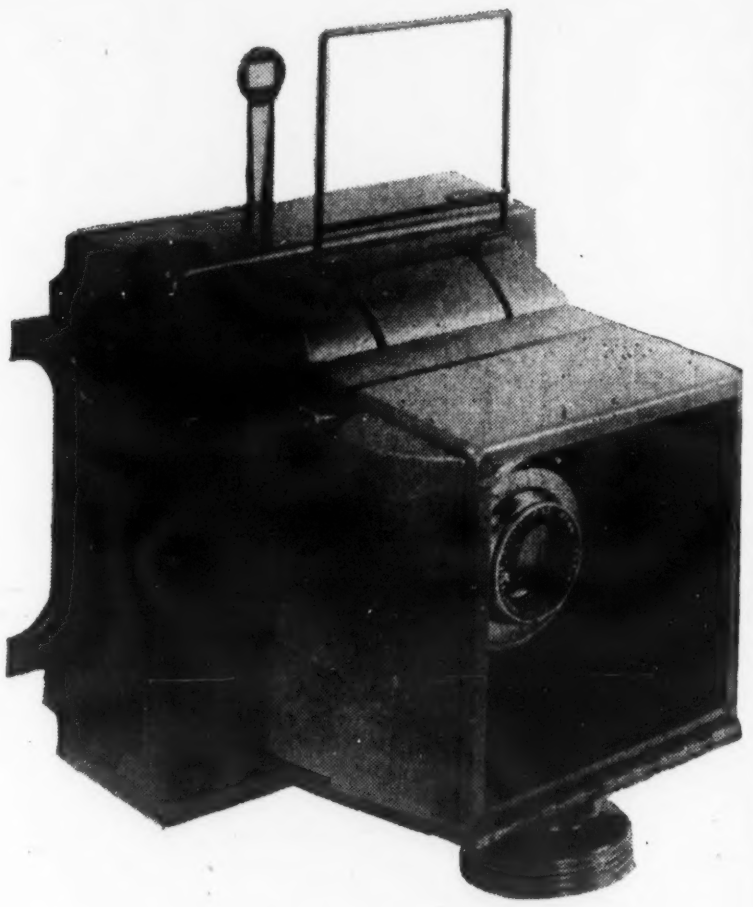
Today Graflex, Inc. owns two well equipped factories in Rochester, N. Y., and a fully integrated branch in Los Angeles, Calif. Sales-Service facilities are maintained in Los Angeles, New York City, and in Toronto, Canada, where its wholly owned subsidiary company bears the name of Photometric, Ltd. A sales office is also maintained in Washington, D. C.

There are approximately 750 "Members of the Graflex Organization," some of whom have been associated with the Company and its antecedents for more than thirty years.

Today, Graflex manufactures a wide variety of cameras for industrial, professional, military, press and amateur customers, as well as a complete line of accessory equipment.

The Graflex Export Department sells to approximately 350 government, distributor and retail accounts in 55 foreign countries and is steadily increasing its sales volume as fast as international currency problems permit. The world-wide use of Graflex products by the Allied Forces has created a strong preference for them in many areas formerly dominated by European brands.

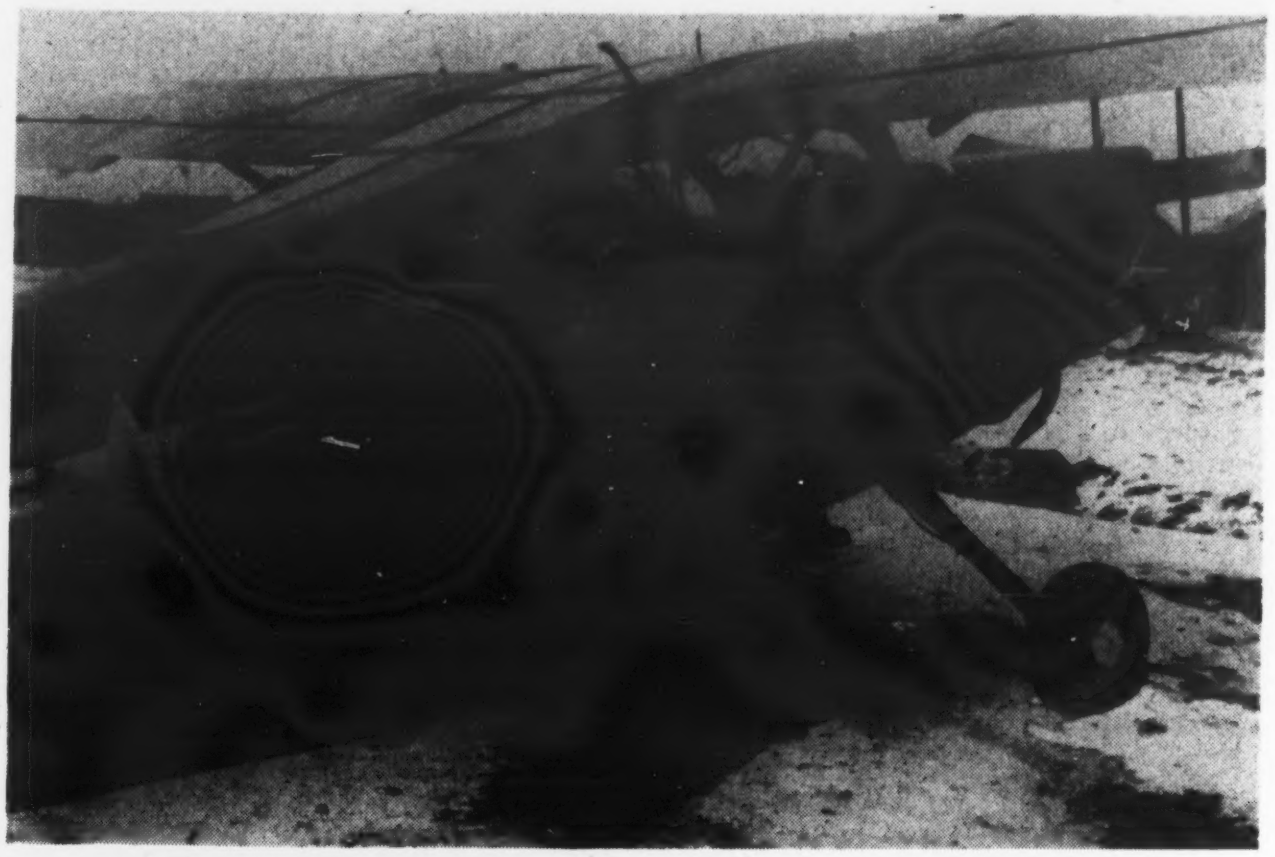
Graflex maintains a large, well-staffed development and engineering laboratory which is constantly at work improving the design and construction of



Right: The Graflex combat "45" is well shielded against sand, salt spray, and other damaging elements in heavy fighting. This is the camera that produced many of World War II's finest Marine combat photographs.

equipment and devising new and better answers to all manner of photographic problems. Before, during, and since the war, this group developed for the U. S. Government and other "priority" customers a wide variety of recording cameras, aerial equipment, photo-electronic devices and the like.

Some notable examples of the wide range of photographic applications and the specialized development work Graflex, Inc. is equipped to do can be found in a brief look at the Company's activities during World War II. In addition to supplying many thousands of complete Speed Graphic units, the standard ground camera equipment of all branches of the Armed Forces, Graflex developed automatic Target Practice cameras as well as the now-famous K-21 camera for aerial work and was a major producer of K-20 and K-25 units for the Air Forces. A special ground camera designed to withstand the unusual rigors of South Pacific weather conditions as well as the hard knocks of front-line warfare, the Combat



The Graphic aerial K-21 is being widely used in the Korean war.

Graphic cameras have long been in the forefront of combat. Above, in Korea, and below, with Australian troops in a World War II invasion of Borneo. The photographer, standing in the landing craft, is a U. S. Coast Guardsman.

Graphic "45," was developed and produced in quantity for the U. S. Navy and Marine Corps. Graflex also manufactured such diversified military equipment as portable microfilm units, high-speed personnel identification cameras, flash synchronizers, carrying cases and other related camera accessories.

Graflex field technicians are assigned the responsibility of Graflex services to the Army and Navy establishments in the United States. Their services embrace, among other things, instruction of Military personnel in both the use and care of their Graflex-made equipment.

Graflex Products

Among the most prominent Graflex products is the Graphic camera, today represented by the Pacemaker Speed Graphic and the Crown Graphic and the lower-priced Century Graphic. Developed around 1898 as an outgrowth of the "hand" cameras of those times, the Graphic design has been modified and developed until today it is the standard against which all press-type cameras are measured.

The original Graphics somewhat resembled today's Pacemaker Crown Graphic, although by today's standards they were crude affairs. In 1912 the focal plane shutter, which had been available previously as an accessory to attach to the back of a Graphic, became an integral part of the first Speed Graphic camera. Offering a wide range of consistently accurate shutter speeds up to 1/1000 second, the focal plane shutter ranks with color film, the automatic diaphragm and lens coating as one of the major triumphs of the photographic industry. In addition to its high speed range, this type of shutter offers certain technical advantages never yet matched by even the finest between-the-lens shutters.

With the rapid growth of photogra-

phy to illustrate newspapers and magazines, the Speed Graphic filled an important need because of its ruggedness, ease of portability and operation, high-speed focal plane shutter and other features which ideally met the problems of press photography. By 1928, the Speed Graphic had almost completely supplanted European cameras and the larger Graflex as the standard American press camera, a reputation it continues to enjoy as the product is steadily improved to keep pace with the ever-increasing demands upon it.

Today's Crown Graphic is in all respects similar to the Speed Graphic except that it does not have a focal plane shutter. This camera enjoys a wide sale to both amateur and professional photographers who do not require the fast action-stopping versatility of the Speed Graphic.

During World War II, the 4 x 5 Speed Graphic was adopted by all branches of our Armed Forces as the "GI" ground camera and saw service in every theater of action. Other standard-line Graflex made cameras were also used widely by various military services, as was special equipment mentioned earlier.

The Century Graphic was born in 1949 in answer to the demand for a amateurs and as a second camera for professionals who prefer a smaller negative size for color. (The Century Graphic makes 2¼ x 3¼ pictures while the Speed and Crown are available in sizes making 2¼ x 3¼, 3¼ x 4¼, and 4 x 5 pictures.) This camera has nearly all the features found in the smallest model Crown Graphics.

The Graflex camera was developed in 1901 as an answer to a problem that arose with the development of faster film and increased interest in action photography. Many photographers preferred to compose and focus their pictures on ground glass, but neither a view camera nor the Graphic enabled them to watch the image on the glass right up to the moment of exposure. Folmer & Schwing had devised various models that offered a partial solution but most involved the use of two lenses (among the first, if not the first, twin lens cameras made). This not only increased cost and construction problems, but also involved such technical bugaboos as parallax and mis-matched objectives.

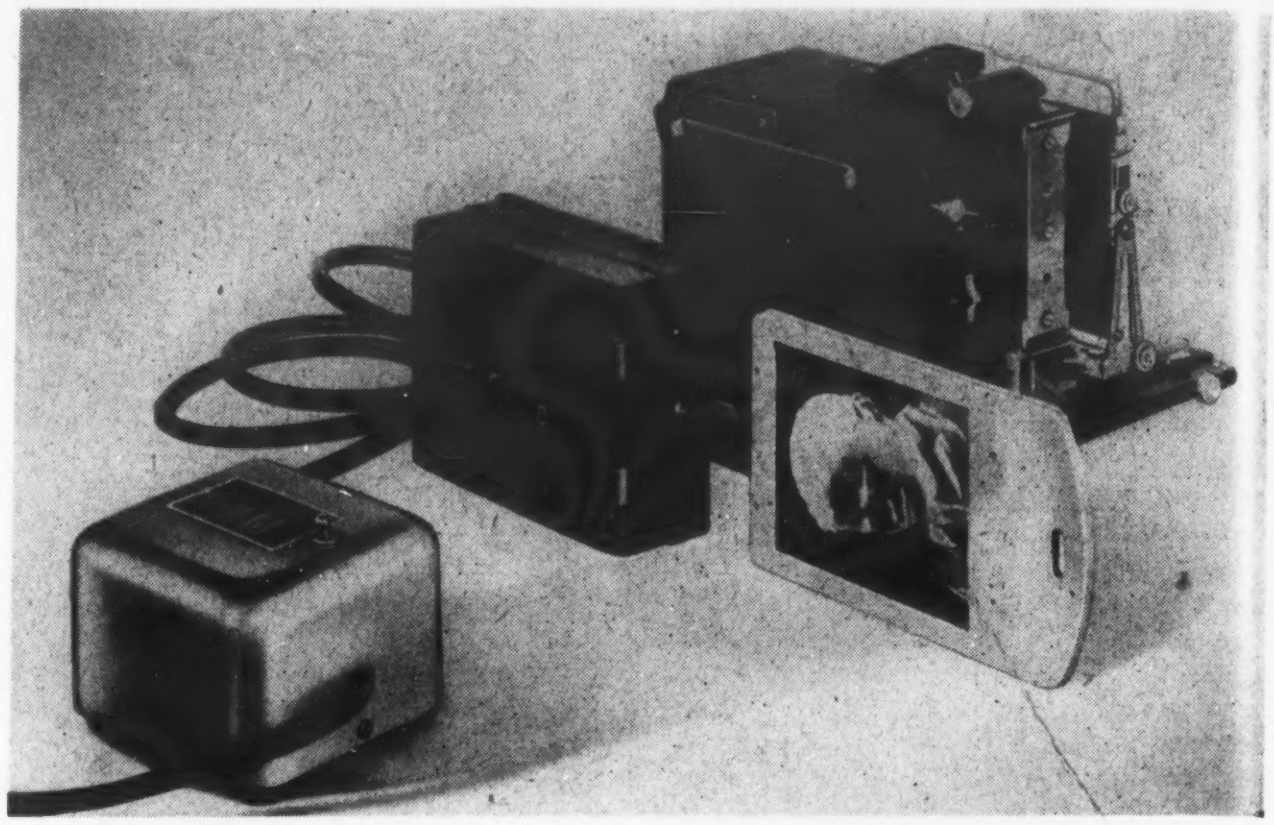
The development of an ingenious mirror arrangement synchronized to the action of the focal plane shutter—and the fact that this type of shutter operated directly in front of the film without obstructing the lens—made possible the single lens reflex camera. The latter addition of an exclusive Graflex feature, the automatic diaphragm, enables the photographer to pre-set his lens aperture at any "f/stop" with the lens "wide open" until the instant of tripping the shutter.

Today the Graflex is used extensively for portraiture and child photography, fashion, pictorial, industrial, scientific work, and for sports. One version of the Graflex is the basis for the familiar newspaper photographers' "Big Bertha," a camera with extra-long focal length lens, up to 60 inches, which permits close-up pictures to be made from a great distance.

Other standard Graflex products include the 4 x 5 Graphic View II, used in many photographic studios and by photo schools as a basic instruction tool; a portable micro-film camera, the Photorecord; a rapid-action Identification Unit for mass-producing personnel record shots; and a broad line of film receptacles, flash units and other accessories. The Company also makes a number of special-purpose military, industrial and scientific cameras on special order.

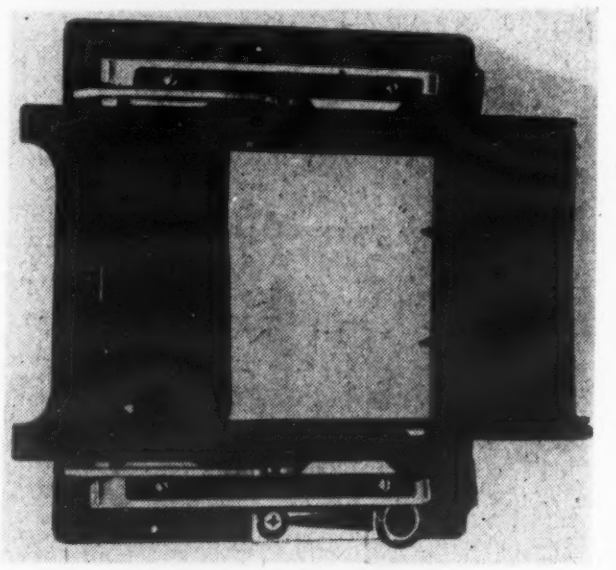
Recently the acquisition of the Ciro camera line by Graflex has broadened the Graflex line even further to include 35mm and twin lens reflex cameras. Soon these cameras will be produced in the Graflex plant in Rochester, N. Y., with the same precision and skill that have gone into the manufacture of all its other products.

In addition to a complete line of cameras, Graflex, Inc., also manufactures a very complete list of accessories, all designed to broaden the scope of camera usefulness and simplify the making of better pictures. These accessories include the unusually versatile Graflite Flash Units, Synchronizer Solenoids, flash connecting cords, and the new Graflarger Back with Aristo cold cathode tube. This latter item converts the camera into a most satisfactory enlarger. Additionally Graflex has made roll film holders for all of its cameras and a quick changing automatic numbering film holder, known as the "Grafmatic" film holder. This is but little

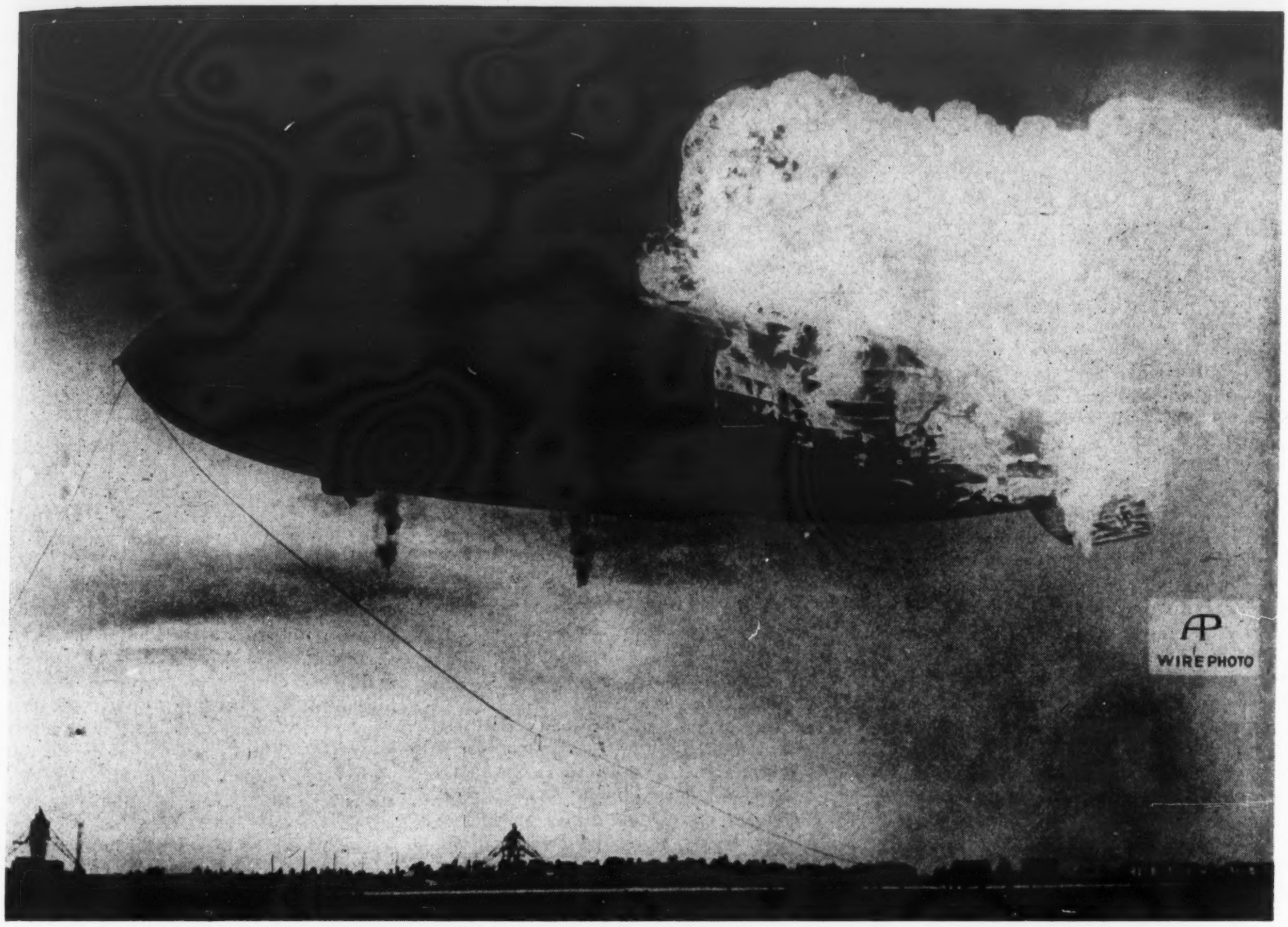


In addition to a wide variety of cameras, Graflex manufactures a complete line of accessories designed to broaden the scope of camera usefulness and simplify the making of better pictures. One of the most recently developed is shown above, the Graflarger Back with Aristo "cold light" which converts the camera into an enlarger.

Two quick change film backs. Above, the roll film holder, and below the sheet film holder.

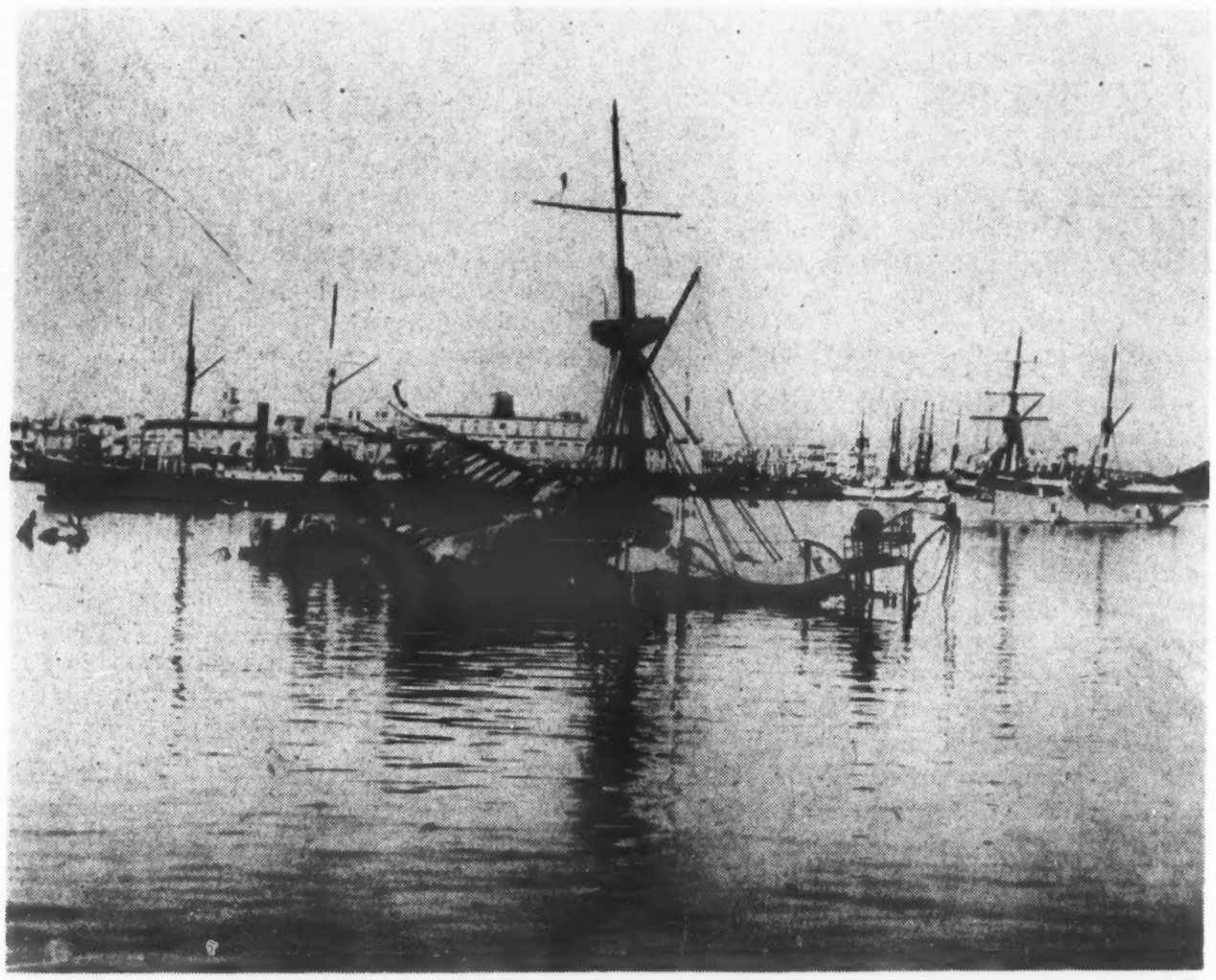


thicker than a standard sheet film holder, yet holds six sheets of film, any of which can be exposed and processed independently of the rest. The development of this holder has been hailed as one of the major recent achievements in the photographic equipment field. The newest accessory products brought to the market include a wholly new all-metal Graphic tripod and a Polaroid-Land "picture-in-a-minute" accessory back for use with the 4 x 5 Graphic cameras. These have already received unusually broad market acceptance.



Graflex cameras have been recording extraordinary events, some of them dramatic and tragic, for over half a century. One of the most striking of these was the Hindenberg disaster, caught by a Graphic camera, as the giant zeppelin exploded while coming in from Europe for a landing at Lakehurst, N. J.

The Graflex Company was young when one of its cameras made this shot of the sunken battleshop Maine in Havana Harbor. The year was 1898.



Summary

Graflex made cameras have been manufactured since 1890, and Graflex, Inc., now actually engaged in the manufacture of many types of precision photographic equipment, finds itself in the strongest position in its history. Civilian demand for its products continues high and the company is currently devoting a large part of its facilities to the manufacture of both standard-line products and highly-specialized types of photographic equipment for the Armed Forces and other essential branches of the government. In the coming year, defense requirements will, of course, have full priority in Graflex' operations as they did during World War II. However, so far as can be anticipated at the moment, a flow of civilian products will continue to be produced so long as materials and facilities permit.

The growing importance of photography in military, commercial, scientific, industrial, and amateur fields continues at the same pace established during World War II. Through the years, Graflex has been outstanding in the development of photography. Graflex will continue to be an important factor in this interesting and exciting field.

HOW TO HANDLE DEFENSE CONTRACTS

By Murray Fiebert

Manager Government Contract Division
CBS-Columbia, Inc.

A visit to any buying agency will quickly convince you that doing 'business with Uncle Sam is more complicated than most realize. The government is not waiting with outstretched hand ready to offer you a defense contract.

The average business man hardly knows how and where to begin in his efforts to get his first contract. At his initial visit to a procurement agency the red tape seems to be endless. It appears difficult to find the man who can give simple answers to direct questions. A few examples of questions which remain unanswered are:

1—As a buyer can you advise your requirements to enable intelligent planning?

2—Is small business being considered in industrial mobilization planning to let contracts?

3—Must a company have a record of past performance before it can receive a negotiated contract Is so, how can a new plant ever get into the defense picture?

4—Will formal advertising procedures be discontinued entirely during the present emergency?

5—Will big business receive the bulk of the contracts?

6—Will it be mandatory for big business to sub-contract a certain percentage of its business?

The current emergency and National Production Authority restrictions places companies in a serious predicament. They must obtain government contracts or close their plants. Knowledge of production methods and procedures in the purchase of supplies and equipment enables business to do a more effective job preparing our country for possible future emergencies.

Organization

A military procurement office can be compared to a large business organization. It is bigger than any business, more unwieldy, and operates as a public agency responsible to the principal stockholders—the taxpayers. The main divisions of most buying agencies are:

1—Stock Control: Storage and supply activities.

2—Engineering: Prepares specifications, invitations, and evaluates technical questions on equivalent bids.

3—Procurement: Makes purchases. The contracting officer or his representatives, usually designated as purchase officers are responsible for issuing bids, screening and making the award, after recommendations have been received by the technical assistants, who evaluate technical exceptions to bids. The contracting officer is responsible for determining a contractor's technical and financial ability to perform before making the award. The contracting officer is responsible for contract modifications and terminations.

4—Inspection: Responsible for inspection and acceptance of manufactured material.

5—Fiscal: Payment of invoices.

6—Industrial Mobilization: Overall planning for war emergencies. Conducts plant surveys, determines plant manufacturing capacity.

7—Engineering Laboratory: Designs specifications for new equipment, tests pre-production models, and conducts research and development projects. In some agencies the laboratory engineers may be called upon to assist in an evaluation of bidder's equivalent quotation, as well as to determine a contractor's technical ability to produce a complicated piece of equipment.

8—Administration Division: Personnel as well as housekeeping problems are the responsibility of this division.

Military and civilian personnel work in cooperation with one another. In most agencies the permanent civilian employee is the brains of the operation. Officers generally receive rotating assignments and are not always as fully informed and familiar with the problems as the permanent civilian employee. Existing policies place the military official in charge of the organization. In every case possible, it is recommended that an effort be made to meet the contracting officer, the purchasing officer and procurement engineers.

Visiting a Procurement Office

Getting on the mailing list is very important. No contractor can expect to receive bids from any buying office unless he has been placed on the mailing list. Formal advertising regulations enable bidders to obtain a copy of an invitation upon request, regardless of whether or not a facility questionnaire has been completed. If a contractor wishes to receive his bids automatically, both for negotiated and formally advertised business, he must get his name on the mailing list. Once a company is on the mailing list of one agency or even one department, it should not be taken for granted that other agencies or departments will list the company. Each agency should be canvassed very carefully and proper forms be completed for each office requiring them.

Upon entering the procurement installation, your company representative must register and produce proof of citizenship. He will be admitted, receive a pass or badge, and referred to the person he wishes to see. On his first visit, he will generally be referred to the clerk in charge of the bid list section or in some agencies it might be the contracting officer himself. Before making your initial trip to a buying agency a contractor should take some preliminary steps. It is recommended that you invest in the cost of preparing a brochure fully describing your company's facilities. The brochure need not be elaborate, but should contain all vital statistics about your company. It is recommended that there be included photographs of the plant interior and exterior showing equipment manfacturing stages, production area, storage facilities, test equipment, material handling equipment, as well as any other item considered to be significant in the evaluation of your company's plant. Also include a brief history of your company, its officers, key personnel and particularly it is advisable to add a thumb nail sketch of the qualifications and experience of your technical personnel, and a history of research and development work handled by your firm. A list of items and quantities produced, and for whom, as well as the total number of employees, area of the plant, and some information regarding your company's financial competence would also be helpful.

Your company should decide on the type of equipment they desire to make for the government. For example, an analysis of company facilities and manufacturing experience might disclose that since the plant is manufacturing television and radios, your facilities are readily adaptable to the manufacture of radar and electronic equipment. The next logical step would be to determine which agencies are responsible for the procurement of electronic and radar equipment. This information can be secured by obtaining a copy of the following publications:

1—Purchased Items and Purchasing Locations of the Dept. of Navy 1 October 49 (Supt. of Doc., Washington 25, D. C.) 15c.

2—How to Sell to U. S. Army (Supt. of Doc., Washington 25, D. C.) 25c.

3—How to do Business with the Air Force—(A.F.).

4—Federal Purchasing Directors—GSA.

When the brochure is available, and you have determined which agency buys the equipment you can manufacture, you are then ready for the next step. Visit the buying office, obtain the necessary forms required by the agency for completion, and make available a copy of your brochure, which will be placed in the file with your completed form when it is returned.

Two more steps should be taken on your first visit to an agency:

1—Review the bulletin board which lists all current invitations. After checking the board you may obtain bid sets by completing a form provided.

2—If at all possible, make an effort to meet with the contracting officer, or his designated representative responsible for buying the equipment you wish to manufacture. If this is not possible during your first visit, make the effort on each trip to the agency.

The contracting officer is responsible for making the award. Wherever possible a copy of the brochure should be given to the contracting officer, personally. Although many agencies delegate this responsibility, the contracting officer is the official who makes the final decision regarding the company to be solicited, both for negotiated and formally advertised bids.

Finally, although your company may be put on the list of one Army office it is absolutely no guarantee that you will be on the mailing list of another procuring agency. For instance, if you have been placed on the Signal Corps' mailing list, you will not automatically receive invitations from the Ordnance Department. Bidders must lay very careful groundwork to insure they are on the mailing list of the different buying offices located throughout the country. There is no central clearing house for bidders desiring to be put on mailing lists.

Regulations

The bible of military procurement is the Armed Service Procurement Regulations. These are the rules and regulations which governs every important phase of military buying. It establishes definite procedures, and prevents widespread abuse of procurement officials by making it necessary to comply with the applicable regulation on any major matter. The ASPR is issued by the Secretaries of the Army, Navy, and Air Force, and establishes for these departments uniform policies relating to the procurement of supplies and services under the authority of the Armed Services Procurement Act of 1947, Public Law 413, 80th Congress, 41 U. S. Code 151-161, or under other statutory authorization. It is recommended that firms doing business with the Government acquire a complete set of the ASPR's. Copies of each Section can be purchased for ten cents from the Government Printing Office, Washington 25, D. C. These regulations are an invaluable aid in understanding and interpretating prerogatives of a bidder, as well as the responsibility of the buying agency. They contain answers to many questions regarding negotiation, contract forms, federal excise taxes, patents and copyrights, labor regulations, clauses for fixed-price contracts, duty and customs, foreign purchases, interdepartmental procurements, advance payments, types of contracts, solicitation of bids, procurement by formal advertising, basic policies.

Bid Preparation

Before completing any of the bid forms accompanying invitation, a competent official of the company should thoroughly read all instructions, schedules and attached papers. Failure to do so can lead to serious error and possible financial loss. A bid should not be signed by a company official unless he understands all clauses and commitments being made. Legal advice should be obtained whenever the terms of an invitation are not clear to the person responsible for signing the bid. The invitation must be reviewed carefully to make sure whether bid bond, performance bond or liquidated damages are required.

Items which must be filled in before submission of the bid include unit and total bid price, discount (it is always advisable to offer the government a discount as it is considered in evaluating price and assists in obtaining prompt payment), acceptance date, f.o.b. point, and delivery information. (This paragraph on delivery is important and should be considered carefully.) Many bidders assume that since the government requires the material within a specified schedule, anybody offering an alternate schedule would not be considered.

This is not so. Bidders should quote realistic schedules. Unless the invitation states that delivery is a material factor in making an award, the delivery schedule quoted by the bidder will not be the determining factor in making an award. In any case, whether or not delivery requirements are material, a bidder should quote his schedules on a factual basis rather than submit an optimistic guess. A bidder must make his bid as complete as the terms specify. When quoting on an "or equal," the bid papers should include the applicable drawings, schematics, photographs when available, commercial catalogs and whatever other information deemed necessary to properly describe the item.

Mailing of Bid

Before mailing the bid, it should be carefully checked to make certain that proper postage has been placed on the envelope. A late bid cannot be accepted by the buying agency. Also bids received by the buying agency bearing insufficient postage cannot be considered. It is sheer negligence on the part of any company to have a bid returned marked "received too late for consideration," particularly in those cases where a considerable sum of money and time have been expended in preparing the bid.

Modification or Withdrawal of Bids

Bids may be modified or withdrawn, at any time prior to the time fixed for opening, by written or telegraphic notice received by the buying agency prior to the time fixed for opening. After the opening of bids, no bid may be modified (except in the case of a minor irregularity or an obvious or aparent mistake of a clerical nature, as provided by regulations) or withdrawn unless such modifications or withdrawal is received before the award has been made and either (1) failure of the modification or withdrawal to arrive prior to the time fixed for opening was due solely to delay in the mails for which the bidder was not responsible or (2) modification is in the interest of the Government and not prejudicial to the other bidders.

Results of Bid Openings

Interested bidders are invited to attend bid openings. They may obtain results of the bid during the opening of bids. The contracting officer or his appointed representative will announce bid prices and other pertinent information during the opening. Those present are permitted to make a complete recording (or abstract) of the bids. If bidder is unable to attend opening, it becomes somewhat difficult to get immediate results of bid openings. All agencies do not have similar procedures for tabulating abstracts. For the most part, the delay in disseminating information is due to the time required in tabulating bid abstracts.

When the bid papers are placed in evaluation, it might take from a day to ninety days before a contract is awarded. Should a bidder not be present at the bid opening he can in most cases call the buying agency for the bid price information. However, certain agencies refuse to furnish this information. Companies manage to get such information by either having a company representative present at the opening, or hiring a reporting company to render the service.

Dept. of Commerce Synopsis

A valuable aid in determining bidding results of bids advertising is the daily and weekly Dept. of Commerce bulletins. The daily bulletin lists all bids which are being made available by the government agencies. The weekly bulletin lists awards in excess of $25,000. These bulletins are available at various Dept. of Commerce offices or banks throughout the city. Extensive use of these synopsis bulletins is urged. It is a useful service designed to assist you in getting prime and sub-contract business.

Results of Bid Openings

Quotations received as a result of negotiation are not opened publicly. Most agencies do not permit bidders to attend bid openings on negotiated procurement. Bidders who are invited to submit a negotiated bid are entitled to information about their competitors' prices, but are not furnished with other details. Procedures on negotiated bids are separate and different from those governing formal advertising. In many cases industry has complained about the manner in which negotiated procurements are handled. It is said that too much secrecy reduces effective competition, which is not the intent of negotiation. Too many agencies appear to have adopted the policy that the right to negotiate implies elimination of competition. This is not intened by the law permitting negotiation.

Acceptance Date

The period of time which a bidder allows for acceptance of his bid is called acceptance date. Government agencies are required by regulations to award a contract with reasonable promptness and by written notice to that responsible bidder whose bid, conforming to the invitation for bids, will be most advantageous to the Government, price and other factors considered, provided that an award shall not be made to other than the lowest responsible bidder except in accordance with procedures prescribed by each respective department. Due to the backlog of work in most agencies, there are usually long delays in processing the paper work. This means that a bidder may have to wait as long as ninety days for his contract. In many cases it has been found that from the time a bid quotation was submitted until receipt of an award costs have changed considerably. To protect himself, a bidder has the right to limit the time in which the Government may accept his offer. Government agencies should make greater efforts to speed up the paper work, to enable faster contract placement. If present day cycle of procurement remains unchanged this might develop into a serious problem and it is advised that bids be prepared accordingly.

Formal Advertising and Negotiation

There are two methods currently in use by the Government in procuring supplies and services: Formal advertising and negotiation.

Formal Advertising: Procurement of supplies and services in excess of one thousand dollars by competitive sealed bidding. This method requires that an invitation be issued by the procuring agency which fully describes the material or service to be procured. Specific methods of soliciting bids are established by regulation. Contracting officers are required to solict bona fide manufacturers or regular dealers and must permit sufficient time for the contractor to enable preparation of a bid. This method of procurement provides for the method of mailing of bid, display in public places, publishing in newspapers or trade journals, as well as setting requirements for methods of submission, modification or withdrawal of the bids. Other specific requirements established by regulation under formal advertising procedures include method of opening bids, recording of bids, rejection of bids, waivers of minor informalities or irregularities in bids, consideration of mistake in bids, information to bidders, and finally method of evaluating responsible bidder and the award to the lowest responsible bidder. Government procurement officials must consider each of the foregoing requirements before making a decision. Failure to adhere to the requirements is a serious breach of regulations. It is recommended that all bidders become thoroughly familiar with the Armed Service Procurement Regulations. Many bidders do not seem to exercise prerogatives when bidding under formal advertising procedures. A few examples are:

1. A bidder may request an extension of opening date of bids, if he cannot complete his bidding in time or if bid forms, specs., etc., are not available.

2. A bidder has a right to protest an award, if he believes that the solicitation was inequitable, or that his competitor was allowed an advantage or shown partiality.

3. Can request deletion of restrictive specifications in the invitations.

4. Can obtain clarification and revision of invitation description.

5. Can revise delivery schedules by submitting an alternate schedule.

Negotiation: Circumstances which permit negotiation are:

1—National Emergency
2—Public Exigency
3—Purchases Not in Excess of $1,000.
4—Personal or Professional Services
5—Services of Educational Institutions
6—Purchases Outside of the United States
7—Medicines or Medical Supplies
8—Supplies Purchased for Authorized Resale
9—Perishable Subsistence Supplies
10—Supplies or Services for which it is impracticable to Secure Competition by Formal Advertising
11—Experimental, Devolopmental, or Research Work
12—Classified Purchases
13—Technical Equipment Requiring Standardization and Interchangeability of Parts
14—Technical or Specialized Supplies Requiring Substantial Initial Investment or Extended Period of Preparation for Manufacture.
15—Negotiation After Advertising
16—Purchases in the Interest of National Defense or Industrial Mobilization
17—Otherwise Authorized by Law
18—Construction Work.

Any military procuring agency can resort to negotiation when any of the above mentioned conditions exist. Most of the agencies are currently negotiating under Section I National Emergency, as a result of the Korean War. Small business has protested extensive negotiation, as it is felt that the war objectives can be accomplished as expeditiously and more economically by formal advertising, and that small business would obtain a greater share of defense business.

Evaluation

Responsible bidder: A responsible bidder is a bidder who satisfies all of the following requirements.

a. is a manufacturer or regular dealer

b. is financially and otherwise able to perform the contract

c. is otherwise qualified and eligible by law.

A bidder who qualifies as a responsible bidder and who submits a low bid without taking any exception to the advertisement is entitled to the award. There have been occasions when agencies have disqualified a bidder, despite the fact that he submitted a low bid. A contractor who submits a low bid and does not receive a contract should request the basis for his disqualification. While the procuring agency has the legal right to disqualify a low bid, due to contractor's financial or technical inability to perform, there should be no objection on the part of procurement officials to release the reason for disqualification. Should an agency refuse to furnish this information, the low bidder has the right to protest the award. and in most cases should do so but only in those cases where an agency refuses to indicate the reason for disqualification.

Protesting an Award

An award may be protested several ways. (1) The protesting bidder may write directly to the Contracting Officer, stating his grievance and ask for a complete explanation of the action taken. (2) The bidder can write directly to the Commanding Officer of the agency, and request the applicable facts. (3) The bidder may write directly to the chief of the technical service, e. g. Chief Signal Officer, Chief of Ordnance, Chief of Medical Corps, etc., and request a review of the case. (4) Submit a request to his Congressman or Senator. (5) Write either to the Secretary of Air Forces, Navy or Army or Defense for satisfaction. It is recommended that the first procedure be followed.

Despite an active buying program agencies have a tremendous paper backlog, as well as a shortage of trained personnel. Activities of many buying departments have been established on the basis that paper work should flow through on a production line basis lead

ng to division of labor, and resulting n one final decision being analyzed by dozen different departments before he action can be completed. For example, if a bidder submits a low bid nd attaches a letter qualifying his bid, n award cannot be made by the contracting officer unless some of the following actions are taken:

1—An engineer must review the bid o determine if it complies with the requirements.

2—A contract specialist or lawyer will check to see if exceptions are taken to the clauses or material.

3—An expert on finances will ask for information on the bidder to ascertain if he has the financial ability to perform.

4—An investigator will check the bidder's facilities and find out if he has the test equipment, space and facilities to manufacture.

When a few or all of the foregoing steps are taken, then the Contracting Officer may make an award if he has an acceptable recommendation, or he might submit the entire folder to an awards committee for more discussion and delay. As a result, it might take ninety days before a contract can be awarded. Whether or not the system has merit, this fact must be considered by the bidder attempting to do business with the military procuring agencies.

Procuring agencies are charged with the responsibility of purchasing material for the government at the lowest expense to the nation. This does not mean that a low bidder will be awarded the contract in all cases. If a bidder does not have the technical ability, or lacks adequate financial resources, it would be to the government's detriment to make an award to a concern that could not deliver.

A low bidder must produce evidence of his financial ability and should be prepared to submit one or all of the following to the evaluating official or contracting officer:

1—The latest certified balance sheet and a profit and loss statement.

2—A flow chart showing how the bidder plans to employ funds on a monthly or weekly basis.

3—A letter from a bank, or reliable financing institution stating that the bidder enjoys a satisfactory credit line, and that credit would be extended for the contract in question.

4—A statement from supplier indicating that they would extend the necessary credit to enable completion of the contract, a list of all contracts to enable the evaluating official to determine the maximum working capital that will be required by the successful bidder based upon current backlog.

5—A personal guarantee.

6—A list of large dollar value contracts successfully completed.

7—A bid bond in those cases where the invitation specifies one is required.

A bidder who is being considered for a contract must produce satisfactory evidence that he can perform by manufacturing equipment in compliance with the specifications. He should make available information regarding his management personnel, his technical personnel, and a brief history of key employees in the organization. Statistics regarding area of the plant, and inventory of the equipment, test equipment and service facilities should be made available. Storage facilities and a history of successfully completed contracts covering complicated productions items or research and development may also be requested.

Award of the Contract

After a bidder has complied with the request of the evaluating agency, and has submitted all information regarding technical and financial ability, he may expect a contract, if the results of investigation show his concern to be a reliable source. In some cases the bidder may be the lowest bidder, or even third or fifth low, in those instances where the lower bidders might have been disqualified due to their inability to prove financial or technical competence. Nevertheless, after a bidder has been investigated and receives a contract, regardless of if he were lowest or fifth lowest, he is legally obligated to produce under the contract, and must take every possible precaution to insure against default. Should a bidder default in his contractual obligations, the government may terminate the contract and purchase against the contractor. If this is done, the contractor whose contract is terminated would be required to pay the difference between his bid and the next bid, should the government have to pay more for the material. Termination is very serious. A contractor whose contract is terminated establishes a very poor regulation for his company, and in many cases it will prevent his getting additional business from the agency terminating his contract.

Inspection

Many bidders overlook the importance of the inspection phases of production. Contractors who haven't done any business with the government usually add a small percentage to their bid price, after their first contract, when they learn about the full extent of the specifications as it involves inspection procedures. In many plants, friction develops between the government inspector and the contractor. Some contractors, who have set up quality control procedures resent an inspector who is scrupulously thorough in performing his duties, claiming the inspector to be a bottleneck. While in some cases particularly where an inspector may not be fully experienced, this may be true, such thoroughness is considered necessary to insure that the armed forces get materials which will fully meet specifications. A contractor should read his contract carefully making sure he is familiar with the specific paragraphs pertaining to inspection, packing and marking. He should have the required equipment available, whenever certain tests are to be performed. Once a routine is established, compliance with inspection provisions become relatively simple. On the government's part, an effort should be made to speed up the inspection service. There are countless cases where a government expeditor will work for months in a vigorous effort to get a manufacturer to produce the material, only to hear from an irate contractor that the government held up the contractor for two months after production was completed in order to get an inspector into the plant. An effort should be made to overcome this shortage of inspectors. It delays delivery of material, creates lack of faith in the government's speed-up program, develops lack of confidence in the expediting officials, and requires bidders to increase their bid price since they have to take into consideration an additional two months during which their funds will be frozen.

Mistakes in Bid

The government recognizes that a bidder, like any human being can make a mistake. Procurement regulations provide for mistakes in bid as follows:

Minor Information or Irregularities in Bid: The contracting officer shall give to the bidder an opportunity to cure any deficiency resulting from a minor informality or irregularity in a bid. Examples: Inadvertent failure to furnish bid bond with bid; failure to affix corporate seal; failure to furnish required catalogs, cuts or descriptive data.

Obvious or Apparent Mistakes of a Clerical Nature: Any clerical mistake obvious or apparent on the face of a bid may be corrected by the contracting officer. Examples: Obvious error in placing decimal point; obvious discount errors (1 per cent 10 days, 2 per cent 20 days, 5 per cent 30 days), erroneous quotations of a lower price f.o.b. destination than f.o.b. factory.

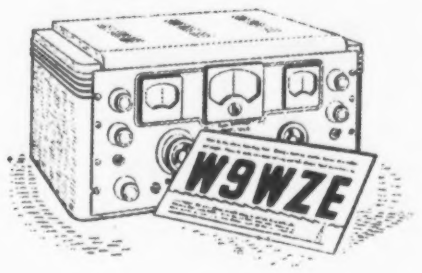
Mistakes Other Than Obvious or Apparent Mistakes of a Clerical Nature: Any suspected or alleged mistake in bid other than the above, a contracting officer must obtain from the bidder, prior to award, either a verification of the bid or evidence in support of the mistake, whereupon the case shall be processed to the GOA, provided that:

If the bidder fails or refuses to furnish evidence in support of the mistake, the contracting official shall consider the bid in the form submitted.

If a bidder furnishes evidence in support of a mistake, he must submit supporting evidence including work sheets, and other data used in preparing the bid, which set forth the complete facts on which the allegation of mistake is based. The bidder must also request definite relief such as withdrawal of bid or change in bid price.

hallicrafters

"The Radio Man's Radio"



When the Japanese bombs crashed down at Pearl Harbor, and regular wire and radio communications facilities were damaged, a small but powerful radio transmitter, designed originally for America's radio amateurs and sent to Hawaii by the Signal Corps, was pressed into service. For a few desperately critical hours it provided the battered survivors of the infamous sneak attack with their only contact with the rest of the world.

That transmitter was the widely acclaimed HT-4, designed and built by the Hallicrafters Company, Chicago. It later became the voice of the Army Signal Corps' famous SC-299 and CS-399 mobile radio stations and saw service on every allied battle front from the Aleutians to New Guinea and from El Alamein to Bastogne.

The HT-4, and its associated equipment, provided one of World War II's most dramatic demonstrations of the part played by America's radio amateurs, and the companies which build equipment for them, in the successful outcome of the war—a role they are assuming once again as rearmament gathers momentum in 1952.

The truism that a successful institution is nearly always "the lengthened shadow of a man" was never more aptly applied than in the case of the Hallicrafters Company whose founder and president, William J. Halliigan, was recently elected president of the Armed Forces Communications Association.

Bill Halligan—or W9WZE, as he was better known to thousands of radio hams from Ketchikan, Alaska to Bombay, India—today heads a company which is one of the country's ten largest producers of television sets and which turns out more communications type radio equipment than any other in the industry.

And even though he has mastered the techniques of assembly line production and learned to operate within the limitations and discipline imposed by a very large and successful business organization, he is still an amateur at heart. He has never lost the urge for experimentation and the passion for precision and perfection which are the hallmarks of the indefatigable, dyed-in-the-wool ham.

Halligan had his first introduction to what was to become a life-long obsession as a boy of fourteen in his native Boston. With a group of friends he became interested in wireless telegraphy as a by-product of the study of electricity in a high school physics class. He made his first transmitter with a spark coil and an open gap and contrived a receiver by winding wire around an old cardboard mailing tube.

Using such crudely built equipment, he and his friends enthusiastically practiced code, hacking wide swaths in the band until checked by the agonized QRT's of the operators at the nearby Navy Yard.

After graduating from high school, he passed his exams for a commercial operator's license and worked as wireless man on an excursion boat and several coast-wise steamers. In 1917, as a member of the naval reserve, he was called for duty and served most of his time on a mine layer operating off the coast of Scotland.

By the end of the war he had risen to a CPO rating with a job as chief radio operator on his ship and had decided to seek college training in engineering. He enrolled in the electrical engineering school at Tufts College and later obtained an appointment to West Point. Cupid intervened, however, before he graduated, and he resigned, after three years in order to be married.

After West Point, he worked as a reporter on the Boston Telegram, but continued his hobby as a ham, writing publicity for the American Radio Relay League and conducting a weekly column in the Telegram, called "Radio Waves," which was one of the first radio columns in America.

Then Halligan's boss sent him to New York to work on an ill-fated publishing venture which lasted only a few months and he found himself once more in need of a job, with a wife and, by now, two children to support. In this emergency he returned to his first love, the radio business, this time with an old friend from Boston who was building a flourishing business as an importer of radio supplies.

After a time of selling radio parts, he decided to go into business for himself as a manufacturers' agent. He moved his family to Chicago because he believed, with what has since proved to be excellent foresight, that that city was destined to become the center of the electronics industry.

It was in 1933, while battling the depression as a manufacturers' representative that the Hallicrafters idea was born.

Halligan wanted to build radios which would meet the strict requirements of dedicated hams like himself—not cheap mass production sets, but beautiful little hand made gems each put together with the super-critical choice of parts and the painstaking hand craftsmanship which the amateur would lavish on his own creation. That is why he chose the name Hallicrafters—they were to be radio counterparts of the Roycrofters, who under Elbert

Georgian style building houses the Hallicrafters' main plant and general offices in Chicago.

Hubbard had won fame by producing fine printing, in the tradition of Johann Guttenberg, at East Aurora, New York.

The Hallicrafters idea became the impelling force which actuated the little band of enthusiastic engineers and designers which Bill Halligan began to gather round him. This was true even in the first lean years when the struggling new company had neither plant nor license of its own and was compelled to rely on the assistance of other manufacturers to help produce the sets which they developed.

From the beginning Hallicrafters' engineers set for themselves the dual objective of designing sets which would be good enough to meet the ham's exacting needs, thus overcoming his deep-seated scorn of factory-built equipment, and at the same time, through ingenuity and simplification of design, bringing the cost of such equipment within reach of his none too robust pocketbook.

Radio beacon transmitter TB-147 designed and produced by Hallicrafters for the U. S. Coast Guard.

This engineering approach led to the parallel development of two series of receivers. One series, with low cost as major consideration, was designed primarily to enable the beginner to get started with minimum investment. The other series, necessarily higher priced, but still well under the cost of comparable equipment, was aimed at the advanced amateur and experimenter and incorporated the last word in advanced design and performance.

Typical of the low cost beginners sets developed by Hallicrafters was the S-19, introduced in 1938 to sell for $29.95. It was the first set built to ham standards which sold at such a low price. The S-19 and the S-19R, a modification of it, had a 5-tube AC chassis with band spread tuning, 2-gang condenser, and coverage of all bands up to 40 Megacycles. The S-20 was a similar unit but with 3-gang condenser and an additional stage of i.f. which retailed at $49.95.

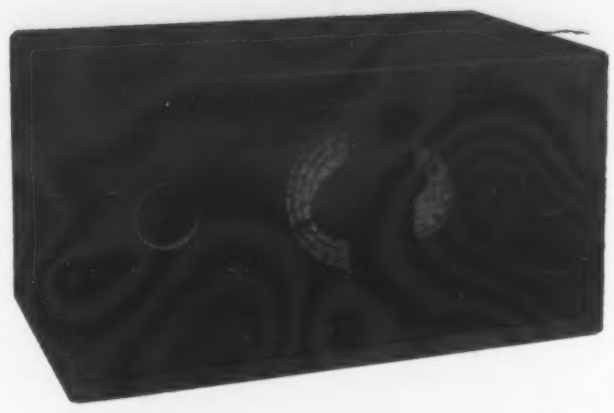
The S-19 was the forerunner of the S-38, of which more than 500,000 have been sold, beginning in 1940 and 1941. It was introduced at a price of $36.50 and its postwar version, restyled by the famous industrial designer Raymond Loewy, is still a leader in the Hallicrafters line, though higher present-day costs have raised its price to $49.50.

The S-38 offers an interesting example of the ingenuity of Hallicrafter engineers. They found that by producing feed-back from the grid to the plate, the i.f. tube could be made to serve as an improved Beat Frequency Oscillator, and at the same time obviate the need for a separate tube. This permitted a reduction from five to four tubes (plus rectifier) while retaining the required stability and amplification. Hallicrafters has been granted a patent on this development.

Paralleling the low-end developments from the S-19 to the S-38 was a series of high performance receivers in which the resourcefulness of the engineers had even wider scope. One of the first units of this type was the SX-17, introduced in 1937, which retailed at about $175 and featured a noise limiter. This set had two stages of R.F. and a diode limiter circuit which wiped out ignition interference and reduced static.

The next set in this series, the SX-18, featured a variable image rejector. In this model the image was balanced out with a capacity bridge circuit.

Later came the SX-28, which was introduced in 1941. This was a high performance unit which was the first to use the accurate, resetable method of dial calibration which is almost universally used in better receivers today. This set had two stages of r.f. electrical band spread tuning and excellent mechanical stability. Much of its usual flexibility was due to a six-position selectivity switch—three narrow positions using a crystal filter and three wide positions which substantially expanded the width of the I.F. channel.

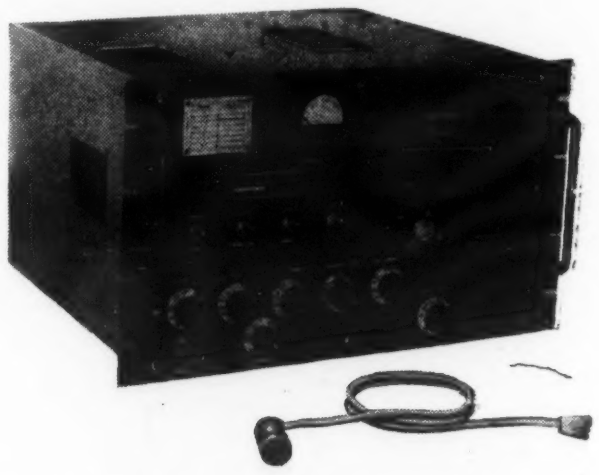


Over 500,000 of these low cost four-band receivers covering 540 KC to 30 MC have been produced.

The post-war SX-42 had many of the features of the SX-28, plus continuous frequency coverage from 540kc. to 110 mc., a new higher signal to noise ratio and styling by Raymond Loewy which struck a bold note in functional beauty. This is the set which Fortune Magazine recently called "an outstanding example of forthright design."

From the very early days of radio the demand for broadcast and commercial channels in the "good" lower frequencies resulted in the radio amateur being progressively "pushed upstairs" into the higher and less developed frequency ranges. Hallicrafters engineers consequently found themselves probing their way into the VHF and UHF regions, and as early as 1936 introduced the first commercially available VHF receiver. This unit, the S-10 had a range of 56 m.c. which, it is interesting to note, brackets the present television channels 2 to 5.

The success of the S-10 and the later S-21 led to the introduction, in 1939,



Receiver R-274, developed and being produced by Hallicrafters for Signal Corps. Frequency range 540 KC to 54 MC in 6 bands.

of the S-27 which covered an even higher frequency range—from 27 to 143 Mc. This set was an AM-FM combination receiver through its entire range and was the first set in which the S meter doubled in brass by also serving as the FM tuner. One of its features was flat audio response from 30 to 15,000 cycles. Modifications of the S-27 were ordered by the Army, Navy, and Air Force during World War II and many of these units are still in military use.

During the war, expanded use of

radio forced further utilization of the high end of the frequency spectrum and Hallicrafters had a part in the development of equipment for it. Representative units were the S-37, a 130 to 210 Mc AM-FM receiver built for the Navy, and the EP-142, another Navy development with 200-400 Mc coverage. The company also built radar receivers for 3000 Mc.

Early in the war, after the blitzkrieg in Poland and France had demonstrated the vastly expanded part that radio played in the precise coordination of mechanized units, the U. S. armed forces and their allies turned to the civilian radio industry for better communications equipment.

Hallicrafters, with annual sales just over $5 million, was one of the smaller of these civilian producers, but its short-wave experience with the critical amateurs made it big in "Know-how." Procurement officers, looking for civilian equipment which could be adapted to military needs, found at Hallicrafters much that they could use, with little or no modification.

The HT-4 transmitter, mentioned at the beginning of this article, is a good example of how the ruggedness, dependability and characteristic flexibility of good "ham" design proved readily adaptable to military requirements. Hallicrafters engineers had burned months of midnight oil in the attempt to design a transmitter which would be lighter, simpler, and less costly and yet would have the power, range and stability of the massive, expensive earlier units. The result was a 450 watt transmitter which was about half the size, one quarter the weight, and less than one third of the cost of the earlier complicated contrivances. More important, in cutting down the number and complexity of its circuits and incorporating novel construction features to save weight and cost, they were also building into the HT-4 the basic simplicity and ruggedness which were to make it the only survivor among 20 transmitters of comparable power when the Signal Corps had completed its gruelling tests to select a "voice" for its mobile radio stations.

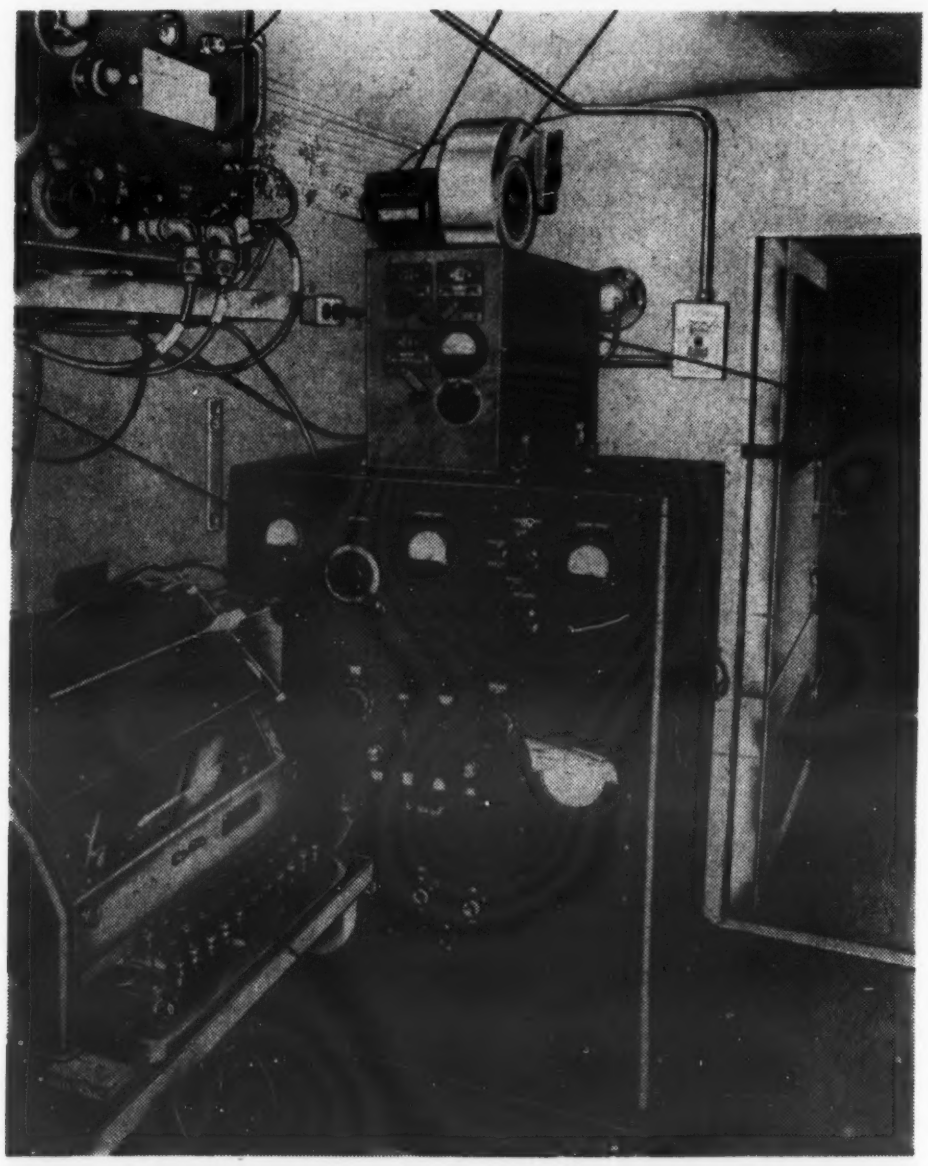
Loading a "hot rail" overhead conveyor for four-hour "shakedown cruise" before TV chassis are installed in cabinets.

The company's first war contracts were stock model receivers; later came orders for modifications and for transmitters; and finally all out effort on complete truck and trailer mobile radio stations including power plant (the SCR-299 and SCR-399). Meanwhile it was also called on to turn out radar and other special equipment for the Navy.

Bill Halligan whose ability as a salesman equals or surpasses his interest in radio turned his persuasive talents and organizing instincts to the job of jumping Hallicrafters production capacities almost overnight. How well the quotas were met is indicated by their total war output of more than $100 million with a peak annual volume of $35 million and by the stars added regularly each six months to the "E" flag which flew above the plant.

A valuable by-product of Hallicrafters' war-time experience as builders of military communications equipment was the exposure of the name Hallicrafters to countless new friends. To the host of "hams" who were the firm's principal pre-war customers were added millions of service men who became familiar with Hallicrafters precision construction and dependable performance through the military communications equipment on which their very lives often depended. In the post-war period many of these men—some women too — became the strongest boosters for the firm and insisted on Hallicrafters equipment for their personal use. The company's advertisements proudly invited. "Ask any veteran about Hallicrafters."

Because Bill Halligan insisted that his production men follow the same sort of flexibility which characterized the company's products, Hallicrafters experienced no major reconversion problems when it resumed the production of civilian products at the end of the war.



Another application of the world famous BC-610 transmitter is in the MRC-26 radio teletypewriter systems now in production at Hallicrafters' plants.

It continued to make short-wave radio transmitting and receiving equipment of the type produced during the war and sold it for both commercial and amateur use. As mentioned earlier, Raymond Loewy, one of the country's top industrial designers, was employed to design the post-war line of communications equipment. His fresh, modern styling, plus numerous technical improvements in each model, contributed to a volume of sales which soon surpassed pre-war levels, despite shortages of material and components which increased costs and at times made the flow of production uneven.

When, in late 1947 and early 1948, it became apparent that television was about to begin its prodigious expansion, few companies in the electronics industry were as well situated as Hallicrafters to move quickly into the design and production of TV receivers.

Since 1933, short-wave and VHF equipment had been its specialty. Not just one or two engineers, but throughout the organization were men who had years of experience in designing and producing high frequency equipment and had developed the precision craftsmanship which is basic for good short-wave performance.

With this wealth of background material, they set their own high standards of television performance, designed their own chassis and began producing the sets which by the end of 1950 were to account for nearly 80 per cent of the firm's rapidly growing sales total. From the first, their aim was to give the television user the same advanced design and precision construction, at a price within his ability to pay, which had been the secrets of their success in serving the radio amateur.

Once more this policy paid off. Hallicrafters television business grew at a rate which was notable, even in the fabulously expanding television business. From a production rate of less than 4,000 sets per month in 1948, their output zoomed to 12,000 per month by early 1950. By the end of that year sets were coming off the assembly lines at a rate of 25,000 per month, and the company ranked among the ten largest producers in the industry.

Portable 152 MC 1 watt carrier two-way FM radio telephone weighing 14 pounds with rechargeable storage batteries.

While leading the way in production expansion, Hallicrafters was also first with a number of technical advances which demonstrated its ability to pioneer successfully in television as it had done for years in communications equipment. When new models were introduced by the industry early in 1950, it was the first to offer a set employing the new rectangular picture tube which was destined to become the standard of the industry.

Four months later, in May 1950, Hallicrafters became the first set manufacturer to utilize the revolutionary new "printed circuit" technique which had been developed during the war for electronic devices which required extreme accuracy in limited space. In the new "Dynamic Tuner," which shortly became standard equipment on all Hallicrafter sets, photographically "printed" circuits replaced the wire coils used to tune in the various channels. The result was greater sensitivity and better stability and rejection of interference—performance advantages especially valuable in weak signal or "fringe" areas.

Halligan is quick to disclaim full credit for originating these innovations, though his engineers worked closely with the suppliers who did the job. "We were first to use them because we are faster on our feet than the big boys," he explains with a grin.

Expansion of the firm's physical facilities kept pace with its engineering progress and its mushrooming sales volume. The new firm acquired its first home when, in 1936, it took over the business and assets of the Ecophone Radio Corp. This firm's leased premises on Indiana Avenue, on Chicago's near south side, were converted to Hallicrafters' needs, and with several expansions and numerous leased outside locations, provided its manufacturing facilities until after the war.

In 1946 the Company completed construction of its present main plant and general officers on West Fifth Avenue, about 5½ miles southwest of Chicago's Loop. This one-story block long building, with 142,000 square feet of floor space, was specifically designed for Hallicrafters and has been called one of the most beautiful and efficiently laid out plants in the electronics industry.

If it were not for the company name displayed on the wrought iron bracketed colonial lamp post in the midst of meticulously kept lawns and flower beds, a first time visitor might be pardoned for mistaking the Georgian brick building for the library of a prosperous New England town. But once past the white-pillared entrance portico and the muraled and paneled entrance lobby, any illusions of similarity between this streamlined example of modern production techniques and the quiet somnolence of a small town library are quickly dispelled.

Emphasis throughout the plant is on straight line production, coupled with

(*Continued on page 76, col. 1*)

SX-62 exemplifies unique blending by Hallicrafters of styling, advanced electronic engineering and precision production to produce a receiver with high fidelity audio system plus full frequency coverage from 540 KC to 110 MC both AM and FM.

From The President

Mothballing preserved many of our Navy vessels, points out President Halligan, making possible the reactivation of many for use now. But, he stresses, our indignation needs to be taken out of mothballs too, and reactivated in the present defense buildup against Red aggression.

Characteristically, after every war, everybody wants to get out of the service. We have a national fever to demobilize and we are all sure in our minds that there will be no more wars and that is about that.

Many of us can remember after World War I the disarmament conferences and the ultimate scrapping of our fleets, as well as the complete dispersal of our armies. The scuttling of our fleets, not only the obsolescent types of vessels, but new ones that were under construction after World War I is now an awful memory. Instead of retaining mastery of the seas, as we could have done, we turned it over to the British and the Japanese. By that act Pearl Harbor became inevitable.

Now again after World War II we saw the same kind of thinking prevailing in our country. This time it was assisted, in my opinion, by a bunch of subversives aided by fellow travelers who went hellbent for election on a complete and rapid demobilization program that left us weak and unprepared only a few short years after the greatest victory in the history of the world.

A great many people at that time suggested that since Russia had no fleet, we would not need one. Fortunately the strong thinkers in the Navy did not feel that way. They developed a substitute for which we should thank them eternally.

Obviously we could not afford the manpower needed to keep all of our fleet units in commission. Was the only alternative to sink them or to leave them to rust? Many thought so.

But the Navy thought otherwise. The technique of mothballing was devised. Our largest and most costly ships were sealed in a protective, airtight covering and the interior compartments were pumped dry of moisture, which causes corroding rust.

In 30 days a ship can be taken out of mothballs.

Since the beginning of Korean hostilities 3 battleships, 9 cruisers, (8 large, 1 light), and 6 small carriers, 78 destroyers and destroyer escorts, and 19 submarines have been taken out of mothballs, manned with crews, and are now guarding the highways of ocean commerce and strategic areas from the Persian Gulf to Korea and from the Aleutians to Australia against communist aggression.

(I am indebted for the above information to Congressman Claude I. Bakewell of Missouri, who combined the above information in a recent speech in Congress.)

Not enough of us realize that our wars and history generally have projected us into a position of world leadership. This is a responsibility we have got to accept. We have got to review our powers and select capable leaders as our best guarantee of peace—and I do mean capable, forceful leaders and not Percy Boys.

If we were now in an all-out war situation, we would all roll up our sleeves and do the same kind of job again. We all feel that way and know we can do it.

Well, why aren't we doing it? I think it is because we have allowed ourselves mentally to go into mothballs. We are not mad enough yet to do a good job in our mobilization program.

This is a complex economy we're living in. It takes an extra amount of doing to make it work. There is no chance to decline the world leadership responsibility.

In any other than a forthright course lies disaster. The boys in the Kremlin are all too eager to take control if we default, So let's get at this thing in earnest. Let's get out of the mothballs and trim ship.

W. J. Halligan

ASSOCIATION AFFAIRS

COMMUNICATIONS • ELECTRONICS • PHOTOGRAPHY

ARMED FORCES COMMUNICATIONS ASSOCIATION

1624 Eye Street, NW
Washington 6, D. C.
Phone: EXecutive 6991

Plans Set for 1952 Meeting

As a result of an early start, and intensive efforts from the very beginning of its planning, the AFCA's Philadelphia Chapter has major arrangements for the Association's national 1952 meeting, in their city in April, already well set. The schedule of events has been arranged, with only the speakers as yet unannounced.

Out to make this year's meeting a topper, the three-day convention program, April 24-25-26, has been arranged by the chapter committeemen so that it might have wide interest to all segments of the AFCA. On the military phase, while the Navy will be the principal host to the Association convention visitors, there has also been scheduled open house at the Air Force and the Signal Corps procurement agencies for the AFCA members.

With U. S. defense mobilization now touching virtually all industry, the forum discussion for the afternoon of the first day of the meeting, "Are Military-Industrial Relations on Procurement and Production Problems Satisfactory?" should be highly appropriate and an exceptional opportunity for industry and military representatives to thrash out procurement and production difficulties in AFCA's particular field of communications - electronics - photography.

The convention business meetings, keynote luncheon, and annual banquet will be held at the Bellevue-Stratford Hotel in downtown Philadelphia. A highlight of the meeting will be the industry sponsored "Get Acquainted" night, the first day of the convention, during which a buffet supper, refreshments, and entertainment will be provided by AFCA industry members in the Philadelphia area.

The Navy program has been set up for the second day of the meeting, beginning with a luncheon at the Philadelphia Navy Yard. The program has not been detailed as yet, but since the Navy's Philadelphia installation is one of the biggest in the country, there should be plenty to see. Open house at the Navy, Air Force, and Signal Corps procurement offices will be held during the morning of the same day. The commanding officers of these establishments are making arrangements to provide the utmost in opportunity for the AFCA members to visit their installations, to inspect them and visit the members of their staffs, with a minimum of formality.

General chairman for the Philadelphia convention is AFCA's 1st vice president, Colonel W. W. Watts, who is vice president of RCA Victor engineering products division, and is currently on part-time loan to the Defense Production Administration. The convention presiding chairman is Colonel J. Harry LaBrum, an AFCA national director, and one of Philadelphia's best

AFCA CONVENTION PROGRAM
April 24-26, 1952

Thursday—April 24

9:00-10:00 A.M.	Registration.
10:00-12:00 A.M.	Council and Directors Meetings (open to all).
12:00-2:00 P.M.	Keynote Luncheon.
2:00-5:00 P.M.	Forum—Subject, "Are Military-Industrial Relations On Procurement and Production Problems Satisfactory?"
7:00 P.M.	"Get Acquainted" night—Philadelphia area AFCA industry members will host all visiting members with a Buffet Supper, Refreshments, and Entertainment.

Friday—April 25

10:00 A.M.	Chapter Presidents' Meeting (open to all members).
10:00-12:00 A.M.	Open House—Signal Corps, Navy, and Air Force Procurement offices.
12:00-5:00 P.M.	U. S. Navy Program—Lunch and Demonstrations at Philadelphia Navy Yard.
6:00-10:00 P.M.	Cocktails, and The Annual Banquet.

Saturday—April 26

Arranged tours as indicated by survey.

Note:—Special programs have been arranged for Thursday and Friday for ladies visiting the convention.

known civic leaders. Major J. R. Curley is chairman of the committee on accommodations and arrangements for the convention.

The Philadelphia group had not as yet determined the overall cost of the various events of the meeting to the AFCA convention visitor, but had announced that the cost was not expected to exceed the $18.50 total of last year's meeting.

Full information on the 1952 Philadelphia meeting will be mailed to AFCA members, and details will appear in the next issue of SIGNAL. Members desiring earlier information should address inquiries to Colonel R. G. Swift, Secretary, AFCA Philadelphia Chapter, 1835 Arch Street, Philadelphia 3, Pa.

1952 Contest — Chapter of the Year

The contest passed the three-quarter mark on December 31st with the high scorers lined up as follows:

	Points		Points
Kentucky	25.67	Seattle	12.09
Gulf Coast	21.29	Boston	11.02
Chicago	16.15	Pittsburgh	11.00
Rochester	14.63	Philadelphia	10.45
New York	12.81	Washington	10.08

The last lap is well on its way, with March 31st as the finish line. The winners will be announced and the Chapter of the Year certificates awarded at the annual meeting in Philadelphia in April.

The Executive Committee at its quarterly meeting in January reviewed the progress of the contest and suggested that consideration be given to special awards for chapters which have been organized or reactivated since October 1st and therefore were not eligible for the regular Chapter of the Year contest.

AFCA GROUP MEMBERS

Communications—Electronics—Photography

Listed below are the firms who are group members of the Armed Forces Communications Association. By their membership they indicate their readiness for their share in industry's part in national security. Each firm nominates several of its key employees or officials for individual membership in AFCA, thus forming a group of the highest trained men in the electronics and photographic fields, available for advice and assistance to the armed services on research, development, manufacturing, procurement, and operation.

Acme Telectronix
Admiral Corporation
Allied Radio Corporation
Altec Lansing Corporation
American Cable & Radio Corp.
American Institute of Electrical Engineers
American Phenolic Corporation
American Radio Institute, Inc.
American Radio Relay League
American Steel & Wire Company
American Telephone & Telegraph Co.
Anaconda Wire & Cable Company
A. R. F. Products, Inc.
Andrews Corporation
Argus Cameras, Inc.
Arnold Engineering Company
Astatic Corporation
Automatic Electric Company
Automatic Electric Sales Corp.
Baltimore News Post
Barry Corporation, The
Bell Telephone Company of Pa.
Bendix Radio
Bergsma Brothers
Bliley Electric Company
Breeze Corporation
Burnell & Company
California Water & Telephone Co.
Capitol Radio Engineering Inst., Inc.
Carolina Telephone & Telegraph Co.
Central Radio and Television Schools
Chesapeake & Potomac Tel. Co.
Churchill Cabinet Co.
Cincinnati & Suburban Bell Tel. Co.
Collins Radio Company
Columbus Process Co., Inc.
Copperweld Steel Company
Cornell-Dubilier Electric Corp.
Corning Glass Works
Coyne Electric School, Inc.
Croname, Inc.
C. R. Daniels, Inc.
Da-Lite Screen Co., Inc.
Diamond State Telephone Co.
Drake Manufacturing Co.
Dukane Corporation
DuMont, Allen B., Laboratories, Inc.
Eastman Kodak Company
Electronic Associates, Inc.
Espey Manufacturing Co., Inc.
Federal Mfg. and Engineering Corp.
Federal Telephone & Radio Corp.
General Aniline & Film Corp.
General Cable Corporation
General Electric Company
General Instrument Corp.
General Insulated Wire Works, Inc.
General Telephone Corp.
General Transformer Co.
Gilfillan Bros., Inc.
Globe Wireless, Ltd.
Graflex, Inc.
Gray Manufacturing Co.
Guardian Electric Mfg. Co.
Hallicrafters Company
Haloid Company
Hazeltine Electronics Corp.
Heinemann Electric Company
Hercules Motor Corp.
Hoffman Radio Corp.
Hycon Manufacturing Company
Ilex Optical Co.
Illinois Bell Telephone Co.
Indiana Bell Telephone Co.
Indiana Steel & Wire Co.
Indiana Steel Products Co.
Institute of Radio Engineers
International Resistance Co.
International Tel. & Tel. Corp.
Jacobsen Manufacturing Co.
James Knights Co., The
Kellogg Switchboard & Supply Co.
Kester Solder Company
Kleinschmidt Laboratories, Inc.
Lavoie Laboratories
Leich Sales Corporation
Lenkurt Electric Company, Inc.
Lewyt Corporation
Lenz Electric Manufacturing Co.
Loral Electronics Corporation
Machlett Laboratories, Inc.
Magnavox Company
Majestic Radio & Television, Inc.
Mallory & Co., Inc., P.R.
Martin, Glenn L., Company
Merit Transformer Corp.
Michigan Bell Telephone Company
Motorola, Inc.
Mountain States Tel. & Tel. Co.
Muter Company, The
National Company, Inc.
New England Tel. & Tel. Co.
New Jersey Bell Telephone Company
New York Telephone Company
Northwestern Bell Telephone Co.
Oak Manufacturing Co.
Ohio Bell Telephone Co.
O'Keefe & Merritt Company
Pacific Telephone & Telegraph Co.
Philco Corporation
Photographic Society of America
Pickering & Company, Inc.
Pioneer Electric & Research Co., The
Platt Electronics Corporation
Precision Apparatus Co., Inc.
Radiart Corporation
Radio Condenser Company
Radio Corporation of America
RCA Victor Division
Raymond Rosen Engineering Products, Inc.
Ray-O-Vac Company
Raytheon Manufacturing Company
Reeves Instrument Corp.
Remington Rand, Inc.
Saxonburg Potteries
Seeburg, J. B. Corporation
Sherron Electronics Co.
Shoup Engineering Company
Shure Brothers
Simmon Brothers, Inc.
Society of Motion Picture Engineers
Sonotone Corporation
Southern Bell Tel. & Tel. Co.
Southern New England Tel. Co.
Southwestern Bell Telephone Co.
Sperry Gyroscope Company
Sprague Electric Company
Stackpole Carbon Company
Standard Coil Products Co., Inc.
Standard Transformer Corp.
Stewart-Warner Corporation
Stupakoff Ceramic & Mfg. Co.
Sylvania Electric Products, Inc.
Telegraph Apparatus Co., Inc.
Telephone Services, Inc.
Telephonics Corporation
Teletype Corporation
Times Facsimile Corporation
Transmitter Equipment Mfg. Co.
Tung-Sol Lamp Works, Inc.
United Radio Television Institute
United States Rubber Company
United Telephone Co.
Utah Radio Products Co., Inc.
Voltz Brothers, Inc.
Webster-Chicago Corporation
Wells Sales, Inc.
West Coast Telephone Co.
Western Electric Company, Inc.
Western Union Telegraph Co.
Westinghouse Electric Corp.
Weston Electrical Instrument Corp.
Willard Storage Battery Company
Wisconsin Telephone Company
Wollensak Optical Company
York-Hoover Corporation
Zenith Radio Corporation

Executive Committee Meeting

The AFCA's Executive Committee met January 17 in Washington, D. C., for its first meeting of 1952, and third meeting for the current fiscal year. The problem of methods of increasing AFCA membership, both individual and group, was given particular attention, with stress on what the Committee itself can do to bring about further increase.

The Association's Chapter of the Year contest came up for considerable discussion at the Committee meeting because of gradually developing inequities showing up in the present system of rating chapters in the annual contest. The inequality in point awarding is becoming evident particularly for chapter meetings, where one group may consist principally of workers in one organization, and another largely of members of entirely separate organizations. Obviously the former are far easier to get together for a meeting than the latter. As a result of the pointing up of this problem during the Executive Committee meeting, it was decided to present for consideration at the coming AFCA national convention a proposal that there be separate awards made to chapters with members made up of one group, such as Army, Navy, and Air Force. If the proposal is agreed on by the national directors the change of rules would of course take effect at the beginning of the new fiscal year, and would not effect the current contest.

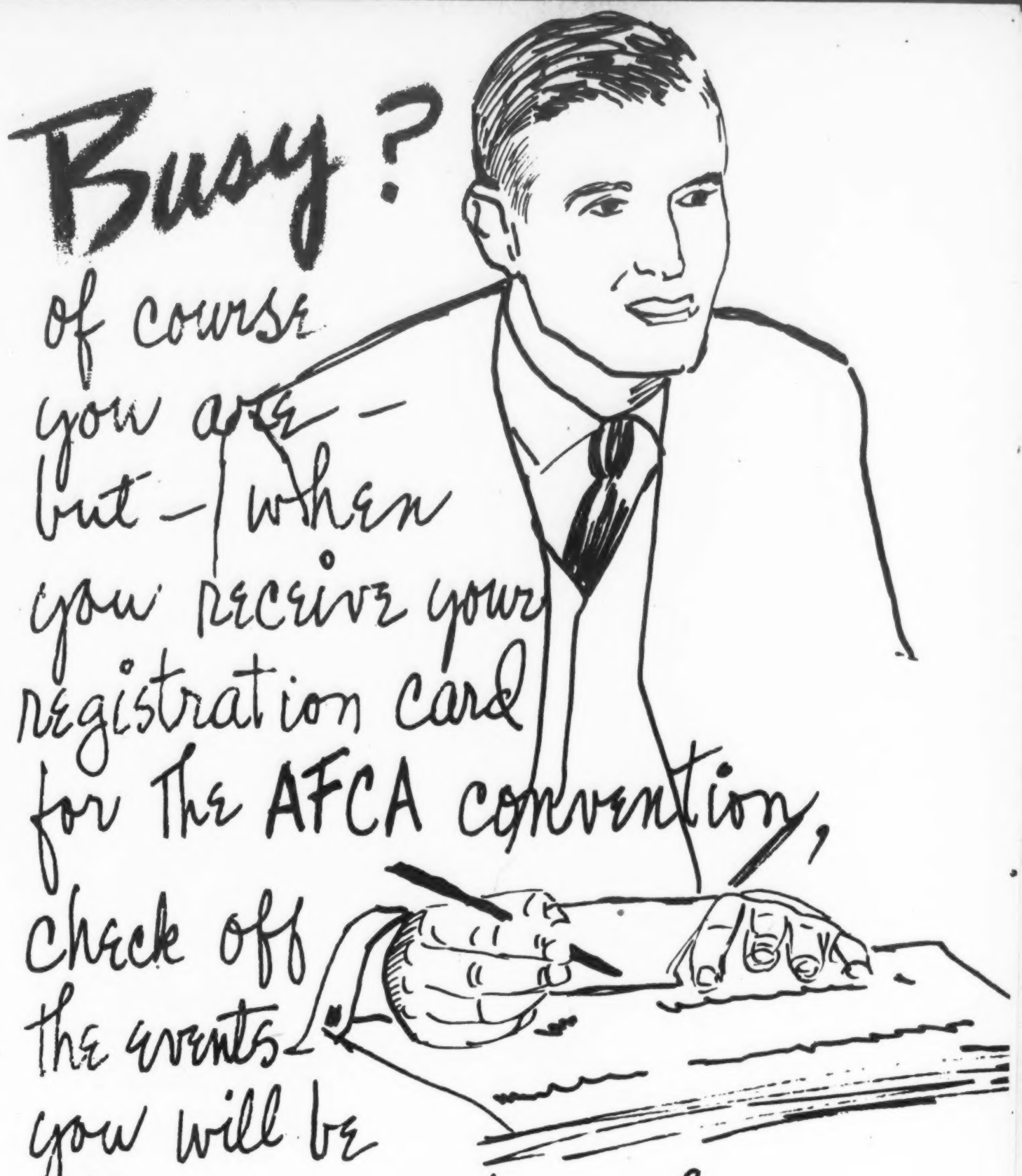
Its own membership and meeting dates were also considered by the Executive Committee at the January 17 meeting. The desirability for an increase of the Committee number to 9 was agreed on, and a proposal for this change will also be presented to the national directors for action at the national convention in Philadelphia. It was agreed to set future Committee meetings for the third Monday following the beginning of each quarter.

Committee member George W. Bailey announced at the meeting that the setting up of an AFCA booth is being arranged for the IRE convention, March 3-6, at New York. Mr. Bailey is executive secretary of the IRE.

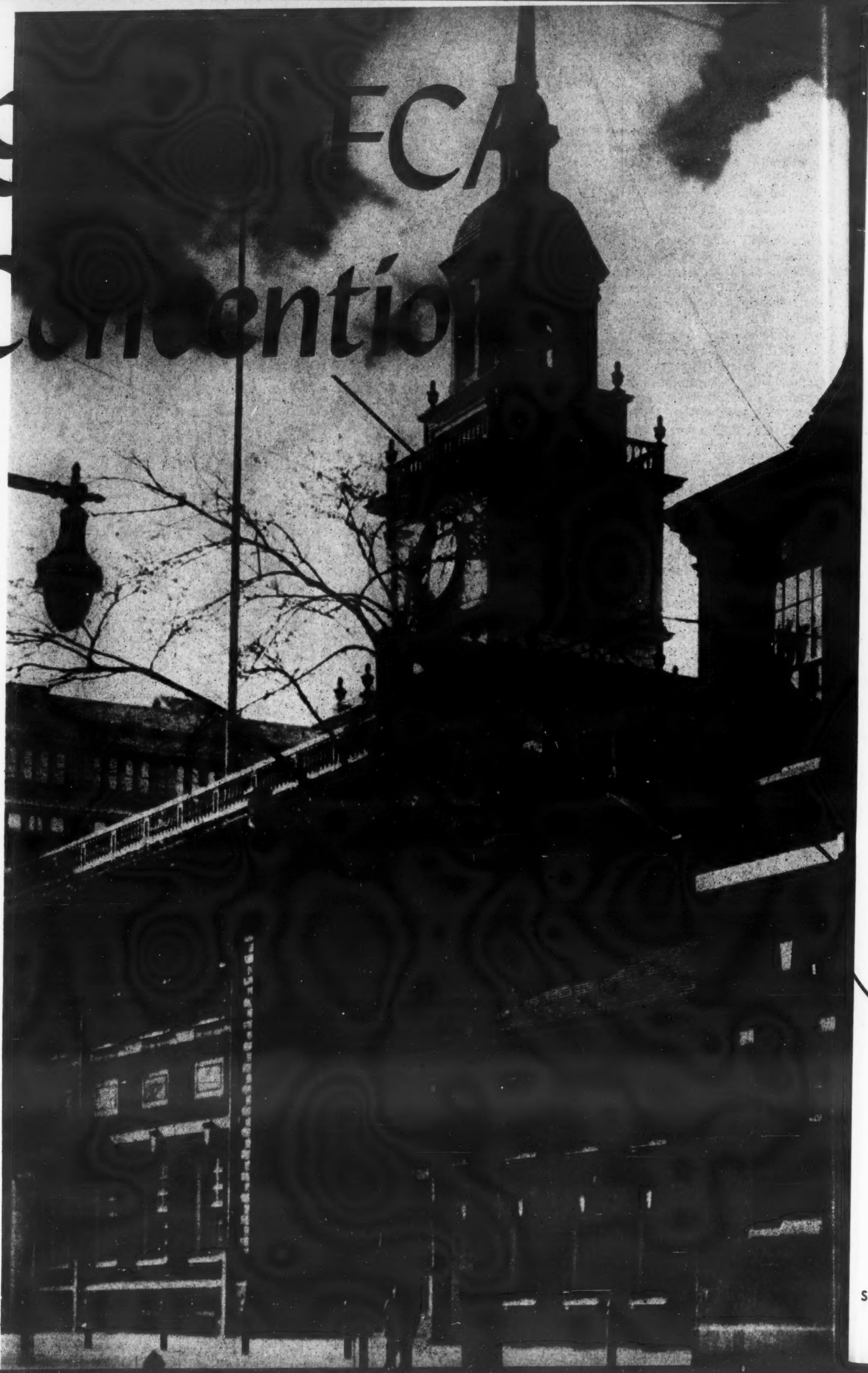
In addition to Mr. Bailey, present at the AFCA Executive Committee meeting were former AFCA Presidents Frederick R. Lack and Theodore S. Gary; Brig. Gen. James D. O'Connell, Deputy Chief Signal Officer, representing the Chief Signal Officer; Captain Richard R. Hay, USN, representing the Director, Naval Communications; AFCA Washington Chapter President Percy Black; AFCA Counsel Frank W. Wozencraft, and Executive Secretary George P. Dixon.

Sec. Dixon Visiting Coast

AFCA's national executive secretary, Colonel George P. Dixon, on a combined business and vacation trip, is currently making a tour of visits to the Association's West Coast Chapters.



19 FCA Convention



The 6th national annual meeting of the Armed Forces Communications Association begins on April 24 this year at Philadelphia. For several months the AFCA's Philadelphia Chapter has been planning and preparing the convention arrangements. They have demonstrated great enthusiasm in their planning, and they proclaim that this year's national meeting is going to be outstandingly the best ever. For the military phase of the meeting, the Navy will be our host, and they have indicated a fine show will be in store for AFCA visitors at the Philadelphia Navy Yard.

This year's AFCA national meeting takes place in an increasing tensity in the U. S. defense efforts, with the mobilization affecting virtually all of industry. It is an atmosphere which brings into sharper focus the AFCA role of industry-military liaison, and makes a national get-together of the Association members at this time particularly fitting.

And in this period when communistic aggression threatens all liberty, it is also especially appropriate that the AFCA's national annual meeting should take place in Philadelphia, the U. S. Cradle of Liberty. It will benefit every member to visit there the historical shrines of our liberty—Carpenter's Hall and Independence Hall, and the colonial homes of many of our immortal heroes, where we may be reminded that these men dared death for the cause of liberty, and thus may undergo a refreshening of our own awareness for the value of that which they gave us—a reawakening for which there is a deepening need in these trying times.

An excellent program is being set up for your enjoyment at the Philadelphia meeting (see the Association Affairs section, this issue), so mark your calendar now for the AFCA's national get-together. When you receive your reservation form fill it out and return it without delay. The place and the dates are———————

Philadelphia
April 24-25-26

CHAPTER NEWS

Chapter of the Year, 1951
SACRAMENTO
President—Paul W. Carrington
Past Pres.—Milton G. Mauer
Secretary—C. A. House

Atlanta

"Electronics in Air Navigation" will be the subject of an illustrated talk before the chapter's January 15th meeting. The program has been arranged by the Federal Telecommunications Laboratories, Inc., AFCA group member, and will be presented by their representative, Mr. L. A. De Rosa.

Augusta-Camp Gordon

Howard Van Zandt, assistant sales manager of the Kellogg Switchboard and Supply Co., addressed the November 13th meeting of the chapter on the second stop on his schedule of visits to AFCA chapters. He first presented his lecture "Adventures in Telecommunications in Japan" before the South Carolina Chapter on November 12th; other appearances were: Gulf Coast Chapter, November 19th; Louisiana Chapter, November 20th; Chicago Chapter, December 13th.

Recently returned to the United States after completing five years as telecommunications advisor on traffic matters with the civil communications section on General MacArthur's staff in Japan, Mr. Van Zandt was able to present a vivid account of communications problems in that country. His work in Japan was primarily that of guiding and helping the top officials of the Japanese Ministry of Telecommunications to solve the innumerable problems that arose as a result of the devastation of the war and during the period of reconstruction. He was fortunate in his dealings with the Japanese to be able to use their language, and is probably the only American telephone man in the world to have this ability. He learned Japanese immediately following World War I when he lived in Yokohama for five years while his father built cement plants in the Orient. During World War II, he brought his knowledge of the language up to date while teaching evening classes for Army and Navy officers attending the University of Oklahoma.

Chapter President Norman Kinley announced that the membership contest had closed with Brig. General Robert A. Willard, commander of the Signal Corps training center at Camp Gordon, as the winner of the AFCA gold medal for having brought in the greatest number of new members. A nominating committee was appointed to select a list of nominees for chapter officers subject to the annual election at the next meeting.

While visiting Camp Gordon, Brigadier A. C. Iyappa, Chief Signal Officer of India, was invited to address the chapter's December 20th meeting. The distinguished guest gave a most interesting account of conditions in his native country. He described the difficulties of nationalizing the government, stating that one of the major problems is the fact that eight or nine different languages are spoken in India, although efforts are now being made to find a common language.

Annual elections were held, with the following officers chosen to head the chapter during 1952: president—Charles M. Eberhart, Southern Bell Telephone and Telegraph Co.; first vice-president—Lt. Col. John Brocko, Camp Gordon; second vice-president—Jess Willard; secretary-treasurer—John Owen, Southern Bell; board of directors—Lt. Col. Fred Elser, Lt. Col. William Rakow, EFC Wanda Black, Hugh Fleming; national council members—Brig. Gen. Robert A. Willard and Major Norman J. Kinley.

After the meeting adjourned, the members and guests held a social get-together around a bowl of the traditional holiday egg-nog.

Boston

Thirty-four years after he had left the Charlestown Navy Yard to serve in World War I as a chief radio operator on a mine layer in the North Sea, Bill Halligan returned to the Naval shipyard in his capacity as national president of AFCA and president of Hallicrafters Company to address a meeting of the Boston Chapter.

Commenting on the vastness of the Navy and the ever present problem of this nation in keeping the armed forces at an adequate strength, Mr. Halligan pointed out that the role of the AFCA is an important one, particularly in providing a common meeting ground for the members of industry, the armed forces and the individual to discuss and iron out their problems. It is this common meeting ground, he said, and the will to cooperate that makes for a great team that is so vitally needed during these times.

"We need a good stirring up in our electronics field," continued President Halligan. "Equipment is moving too slow for our military needs—for planes, submarines, guided missiles, gunfire control, pilotless aircraft and all the other military uses requiring electronic control. We need better equipment and we need more equipment."

Mr. Halligan answered questions from the floor at the conclusion of his talk.

The meeting was held on December 19th at the Charlestown Navy Yard, Charlestown, Mass., with fifty members and guests in attendance.

Chicago

The Museum of Science and Industry was the meeting place for the chapter on October 25th. Co-featured on the program were "Communications Aspects of Civil Defense" and the Automatic Electric Company's new teletypewriter switching system.

Col. James P. Crockett, (Ret.), deputy director of Illinois civil defense and newly appointed deputy director of civil defense for Alaska, outlined communications problems in civil defense activities. In addition, he gave some interesting sidelights on communications within Russia, having served for several years on the staff of the American Embassy in Moscow.

Leith Johnson and Richard C. Stiles, project engineers of the Automatic Electric Company, gave a demonstration of the new, fully automatic teletypewriter switching system for mili-

Chicago Chapter meeting, speakers' table. L to R: D. B. Miller, Coyne Electronics School; James H. Kellogg, pres., Kellogg Switchboard & Supply Co.; Col. Lester R. Kleinknight, deputy C.O., SigCorps Philadelphia Procurement Agency; Chapter President John Howland, Stewart-Warner Corp.; Howard F. Van Zandt, Kellogg Switchboard & Supply Co.

National Director of Chapters: **W. W. Watts, RCA Victor Div., Camden, N. J.**

AREA REPRESENTATIVES FOR CHAPTERS

Area A: George W. Bailey, IRE, 1 E. 79th St., New York, N. Y. *New England States, New York, New Jersey*

Area B: J. H. LaBrum, Packard Building, Philadelphia, Pa. *Delaware, Kentucky, Maryland, Ohio, Pennsylvania, West Virginia and Virginia*

Area C: Ralph S. Grist, So. Bell T&T Co., Atlanta, Ga., *Southeastern States along Atlantic and Gulf coasts—from North Carolina to Louisiana including Tennessee*

Area D: E. H. Mittanck, 711 Telephone Bldg., Dallas, Tex. *New Mexico, Texas, Oklahoma, Arkansas*

Area E: T. S. Gary, 1033 W. Van Buren St., Chicago, Ill. *Michigan, Indiana, Illinois, Wisconsin, Minnesota, Iowa, Missouri, Kansas, Nebraska, North Dakota, South Dakota, Wyoming, Colorado*

Area F: H. L. Hoffman, 3761 S. Hill St., Los Angeles, Calif. *Arizona, Utah, Nevada, California, Idaho, Oregon, Montana and Washington*

CHAPTERS: PRESIDENTS AND SECRETARIES

ATLANTA: President—P. R. Curry, 969 Rosedale Rd., N. E., Atlanta, Ga. Secretary—Capt. Collins L. Cochran, SigSec, Hqs 3rd Army, Ft. McPherson, Ga.

AUGUSTA-CAMP GORDON: President—Charles Eberhart, Southern Bell T&T, 937 Greene St., Augusta, Ga. Secretary—John W. Owen, Southern Bell T&T, 937 Greene St., Augusta, Ga.

BALTIMORE: President—Henry W. Williams, 3953 Cloverhill Rd., Baltimore, Md. Secretary—Donald C. Lee, Westinghouse Elec. Corp., 2519 Wilkens Ave., Baltimore, Md.

BOSTON: President—T. F. Halloran, General Communication Co., 530 Commonwealth Ave., Boston, Mass. Secretary—Maj. Mark T. Muller, Asst. PMS&T, M.I.T., Cambridge, Mass.

CHICAGO: President—John R. Howland, Stewart-Warner Corp., 1826 Diversey Phwy, Chicago, Ill. Secretary—Raymond K. Fried, 111 W. Monroe St., Chicago, Ill.

CLEVELAND: President — Lee J. Shaffer, 820 Superior Ave., N. W., Rm. 205, Cleveland, Ohio. Secretary—T. F. Peterson, American Steel & Wire Co., 1434 Union Commerce Bldg., Cleveland, Ohio.

DALLAS: Acting President— E. H. Mittanck, 711 Telephone Bldg., Dallas, Tex.

DAYTON-WRIGHT: President—Paul H. Clark, RCA Victor Div., 120 W. Second St., Dayton, Ohio. Secretary—Lucille Althoff, RCA Victor Div., 120 W. Second St., Dayton, Ohio.

DECATUR: President—Louis Yack, 2050 N. Main St., Decatur, Ill. Secretary—Chester B. Badgett, Decatur Signal Depot, Decatur, Ill.

EUROPEAN: President—Col. I. P. Doctor, SigO, Frankfurt Mil. Post, APO 757, New York. Secretary—C. E. Laurendine, Comm. Gp., Bi-Partite Control Office, APO 757, New York.

FAR EAST: Acting President—Brig. Gen. Elton F. Hammond, SigSec, GHQ, FEC, APO 500, San Francisco.

FORT MONMOUTH: President—Col. Eugene A. Kenny, 11 Allen Ave., Fort Monmouth, N. J. Secretary—Lt. Col. Ernest E. Knight, Officers' Dept., TSS, Ft. Monmouth, N. J.

GULF COAST: President—Col. John A. McDavid, 3380th TT Gp., Keesler AFB, Miss. Secretary—Capt. Richard B. Deane, 1053½ W. Howard, Biloxi, Miss.

GREATER DETROIT: President—R. Foulkrod, Michigan Bell Tel. Co., 333 State St., Detroit, Mich. Secretary—D. J. Basolo, Michigan Bell Tel. Co., 1365 Cass Ave., Detroit, Mich.

KENTUCKY: President—Col. H. T. Gallagher, Lexington Signal Depot, Lexington, Ky. Secretary—Clyde T. Burke, Lexington Signal Depot, Lexington, Ky.

LOUISIANA: President—C. J. Briant,, 1426 Jefferson Ave., New Orleans, La. Secretary—A. Bruce Hay, Southern Bell Tel & Tel Co., 520 Baronne St., New Orleans, La.

NEW YORK: President—T. L. Bartlett, RCA, 30 Rockefeller Plaza, New York, N. Y. Secretary—David Talley, International Tel & Tel Corp., 67 Broad St., New York, N. Y.

PHILADELPHIA: President—Harry A. Ehle, Int'l Resistance Co., 401 No. Broad St., Phila. Secretary—R. G. Swift, Diamond State Tel. Co., 1835 Arch St., Philadelphia, Pa.

PITTSBURGH: President—S. C. Stoehr, Jr., 2546 Pioneer Ave., Pittsburgh, Pa. Secretary—Robert J. Campbell, 105 Woodside Rd., Pittsburgh, Pa.

RICHMOND: Acting President—E. T. Maben, Chesapeake & Potomac Tel. Co., 703 E. Grace St., Richmond, Va.

RIO: Acting President—Herbert H. Schenck, Caixa Postal 709, Rio de Janeiro, Brazil.

ROCHESTER: President—Joseph C. Wilson, The Haloid Co., Rochester 3, N. Y. Secretary—R. G. Bowie, Eastman Kodak Co., 343 State St., Rochester 4, N. Y.

SACRAMENTO: President—Paul W. Carrington, 1100 Lochbrae Rd., No. Sacramento, Calif. Secretary—C. A. House, Sacramento Signal Depot, Sacramento, Calif.

SCOTTS-ST. LOUIS: Col. William N. Snouffer, PO Dr No. 772, Scott AFB, Ill. Secretary—M/Sgt. Robert L. Oase, Box 163, 3313th Tng Sqdn, Scott AFB, Ill.

SAN FRANCISCO: President—Harry E. Austin, RCA Communications, Inc., 28 Geary St., San Francisco, Calif. Secretary—William G. Damerow, 1625 Pacheco St., San Francisco,

SEATTLE: President—Marshall B. James, 1817 28th Ave. W, Seattle, Wash. Secretary—Merrill R. Stiles, 916 W. 122nd, Seattle, Wash.

SOUTH CAROLINA: President—John L. H. Young, 34 Chalmers St., Charleston, S. C. Secretary—Carl A. Newman, 2807 Monroe St., Columbia, S. C.

SOUTHERN CALIFORNIA: Acting President—Loyd C. Sigmon, KMPC, 5939 Sunset Blvd., Los Angeles, Calif. Secretary—Richard F. Walz, 303 Marine Ave., Manhattan Beach, Calif.

WARREN, F.E.-CHEYENNE: President—Lt. Col Norman Fertig, Qtrs. 116, F.E. Warren AFB, Cheyenne, Wyo. Secretary—Thomas Rhoads, 2117 Pioneer, Cheyenne, Wyo.

WASHINGTON: President—Percy G. Black, 906 Munsey Bldg., Washington, D. C. Secretary—W. P. Dutton, RCA Victor Div., 1625 K St. N.W., Washington, D. C.

STUDENT CHAPTERS

CORNELL UNIVERSITY, Ithaca, N. Y.

NEW YORK UNIVERSITY, New York, N. Y. President—William S. Furman, 225 Sedgwick Ave., New York, 53, N. Y. Secretary—Martin Polan.

OHIO STATE UNIVERSITY, Columbus, O. President—Raymond E. Spence, Jr.; Secretary—Robert Borden.

OKLAHOMA A & M COLLEGE, Stillwater, Okla.

PURDUE UNIVERSITY: Lafayette, Ind. President—Charles Terrell; Secretary—C. Harold Butler.

STATE COLLEGE OF WASHINGTON, Pullman, Wash.

TEXAS TECHNOLOGICAL COLLEGE, Lubbock, Texas. President—Arthur Seybold; Secretary Frank N. Foster.

UNIVERSITY OF ALABAMA: University, Ala.

UNIVERSITY OF CALIFORNIA, Berkeley, Calif.

UNIVERSITY OF ILLINOIS: Urbana, Ill. President—Donald A. Jackson; Secretary—Milton F. Langer.

UTAH STATE AGRICULTURAL COLLEGE: Logan, Utah.

National Headquarters Chapters Secretary: Julia B. Godfrey

CHAPTER NEWS

tary use. A complete description of the equipment demonstrated appeared as last-minute news in the November-December issue of SIGNAL (p. 66).

Conducted tours of the Illinois Filter Center and State Control Room, under the guidance of Paul A. Kirkley, assistant deputy director, communications, and Captain Patrick J. O'Donnell, USAF officer in charge, concluded the evening's program.

Dinner served in the dining room of the museum was followed by a brief chapter business meeting. Chapter President John R. Howland presented a commendation to Raymond A. Johnson of the AT&T for his work on the membership committee. Attendance was clocked at 130 members and guests.

When Howard F. Van Zandt, one of the key American telephone executives who directed the postwar rehabilitation of Japan's telephone system, spoke before the Chicago Chapter on December 13th, it was his 1025th public address since 1932. Labeling his talk Hara Kiri 33-4283 (which in Japanese symbolism means utter confusion and then some), Van Zandt gave the 200 AFCA members and guests an insight into some of Japan's major postwar problems and the United States' responsibility in helping solve them.

The meeting, held at the Cicero Avenue plant of the Kellogg Switchboard and Supply Company, of which Van Zandt is an assistant sales manager, highlighted, in addition to the talk on Japan, a discussion of Signal Corps procurement by Col. Luster R. Kleinknight, deputy commanding officer, Signal Corps Procurement Agency, Philadelphia.

In an illustrated talk, Mr. Van Zandt pointed out that there are going to be American troops in Japan for many years, perhaps 10 or 15, as the U. S. carries out its role in the Mutual Defense Pact. He said it is essential that Americans learn to understand the Japanese people, their thinking and their culture. We need Japan and her three-fourths of the entire industrial potential of Asia, and Japan needs us, and we must work together with harmony in order to present a united front against a common foe.

Col. Kleinknight dealt with the subject of Signal Corps procurement under four main headings: policy, organization, situation and problems. On the subject of policy, he said that the Department of Defense policy set many months ago is being followed, to take even initial steps so as to establish a broad base of supply. This policy has inherent difficulties, such as duplication of tooling and lack of enough volume in the preparatory period to

take up available capacity, but in the long run the policy is working to the nation's best advantage. On the matter of organization, Col. Kleinknight said that, despite considerable difficulties in getting talent, some 3000 qualified persons have been assembled into a team capable of handling the procurement load. Further additions in personnel are necessary in inspection and expediting staffs.

Of the present procurement situation, Col. Kleinknight said that the most important mission now is actually to get equipment. Input to Signal Corps depots now about equals outgo, where stocks have until now been seriously depleted. On standard items such as field wire, industry has done an outstanding job of supply in the past year. As to problems, capacity troubles have now been eliminated, the speaker stated. Components and materials such as crystals are still difficult to obtain in the desired amounts, in many instances. While it is always a problem to get maintenance parts, particularly at the same time as new assemblies, it is expected that this phase will soon be solved, as most procurement is along established lines, with fewer new items to be obtained.

Before and after the meeting, AFCA guests who wished to call one another by phone used the Kellogg Select-O-Phone system, a working model of which was demonstrated by Carl Megelin, manager of the special products division of the Kellogg company. The system, widely used in industries and institutions across the country, provides instant dial intercommunication without the services of an operator, he explained. Assuring absolute privacy, the system is used for conference and person-to-person calls and AFCA executives conducted an on-the-spot conference session over the system.

Cleveland

Cleveland Chapter members were guests of the Cleveland section, American Institute of Electrical Engineers, at a dinner meeting on December 13th. The featured speaker was T. J. Grieser, transmission engineer of the Bell Telephone Laboratories, Murray Hill, N. J., on the subject, "Transcontinental Radio Relay System."

On January 28th, a number of Cleve land Chapter members attended the sixth annual banquet of the Cleveland Technical Societies Council.

Dayton-Wright

The official reorganization of the chapter, which had been in the planning stage for some months, became an actuality on December 14th at a meeting of members and other interested persons in the area.

Temporary officers were elected and plans made for the effective operation of chapter business. Paul H. Clark of RCA Victor Div. was chosen president;

Chicago Chapter members touring Chicago's Museum of Science & Industry are shown Signal Corps' new automatic teletypewriter switching system developed by the Automatic Electric Co.

P. J. Deluhery, Admiral Corp., and Col. Milton G. Mauer, USAF, vice-presidents; David L. Pearlstone, RCA, treasurer; and Lucille Althoff, RCA, secretary.

The meeting was opened by Col. Steve Gadler, who had served as acting president of the chapter, with a review of the chapter's past activities and the renewed interest now in progress. In addition to Col. Gadler, the working committee responsible for the reorganization efforts consisted of: acting secretary Paul Clark; Robert J. McIlrath of Raytheon Corp.; and Pat Deluhery of Admiral Corp. This committee started with four of the old chapter members and by the meeting date already had 45 paid-up members. Also serving with the committee were representatives of Wright-Patterson Air Force Base and all major electronics firms in the area.

Committee chairmen were appointed by President Clark as follows: membership: military—Lt. Col. Richard F. Amann, USAF; industry—Robert J. McIlrath, Raytheon Corp; program—William P. McNally, Maxson Corp. Colonel Gadler was appointed to the

Ft. Monmouth Chapter meeting. Above, L to R: Lt. Col. E. E. Knight, chapter secretary; Col. E. A. Kenny, president; P. R. Everitt and M. Francis of Western Union Telegraph. Below, L to R: Anne M. Stommel, Lt. Col. R. Abramowitz (ret), Col. Fred Timmerman, Maj. Fred J. Johnston, Lt. Col. Rex W. Radsch, Maj. G. D. Vitt, Capt. F. J. J. McCormick (ret.), and Maj. G E. Renault, Jr.

JAN (MIL) and SUPER-JAN (MIL)

...JUST OFF PRESS comes this Sprague Catalog 21 with complete details on paper dielectric capacitors designed to meet Joint Army-Navy Specification JAN-C-25. Comprehensive data on sizes, characteristics, ratings, performance and other factors makes the new catalog invaluable to users of JAN paper capacitor types. Copies are available on letterhead request.

Over and beyond JAN specifications, Sprague has developed many new ways to reduce size and weight and to improve the high-temperature performance of capacitors and other electronic components. In effect, these are "Super-JAN" components—fully approved via JAN deviations to equipment manufacturers and widely used in critical military applications. At the right are four examples of units that Sprague can supply where equipment engineering progress calls for components that *exceed* JAN requirements.

SPRAGUE SUBMINIATURE PAPER CAPACITORS

Hermetically-sealed, metal-encased and far smaller than equivalent JAN styles. Available in types for 85° C. and 125° C. operation. Sprague Bulletin 213-B gives full technical data.

COMPARISON—TYPICAL SUPER-JAN VERSUS JAN UNITS
Metal-Cased Tubular Paper Capacitor, Both Leads Insulated from Case

	Sprague Type 196P47492S1	Nearest JAN-C-25 Equivalent CP25A1EC504K
Capacitance (Mfd., ± 10%)	0.47	0.50
Voltage, DCW	200	200
Insulation Resistance: at 25°C	30,000 M Ω*	6000 M Ω
at 85°C	700*	600 M Ω
at 125°C	20*	**
Capacitance Change (%) From 25°C to −55°C	−4*	−15
Operating Ambient (°C) Max.	+125*	+85
Minimum	−55	−55
Dielectric Test	Twice Rated Volts for 2 Min.	Twice Rated Volts for 1 Min.
Life Test: at 85°C	250 hrs., 1.5 × rated DCWV	250 hrs., 1.5 × rated DCWV
Life Test: at 125°C	250 hrs., 1.4 × rated DCWV*	**
Moisture Resistance	Hermetically Sealed	Hermetically Sealed
Length	1-9/16"	2-1/8
Diameter	9/16"	3/4
Volume (cu. in.)	0.39*	.94

* Ahead of and Beyond JAN ** Above Temperature Limit of JAN-C-25

SPRAGUE

PIONEERS IN ELECTRIC AND ELECTRONIC DEVELOPMENT

SPRAGUE ELECTRIC COMPANY • NORTH ADAMS, MASSACHUSETTS

board of directors, with additional appointments to be made as the chapter expands.

Col. George P. Dixon, AFCA national executive secretary, who had come from Washington for the meeting, was called on to explain how some of the other newer AFCA chapters had been organized, types of meetings held, etc. He covered the methods used by some of the other chapters to attract new members and stressed the importance of planning meetings that would be of interest to both service and industrial members.

After the official business was concluded, Mr. M. C. Banca of RCA Industrial Products, Camden, N. J., gave an excellent talk on "Industrial TV and Applications," demonstrated with a live camera and monitors.

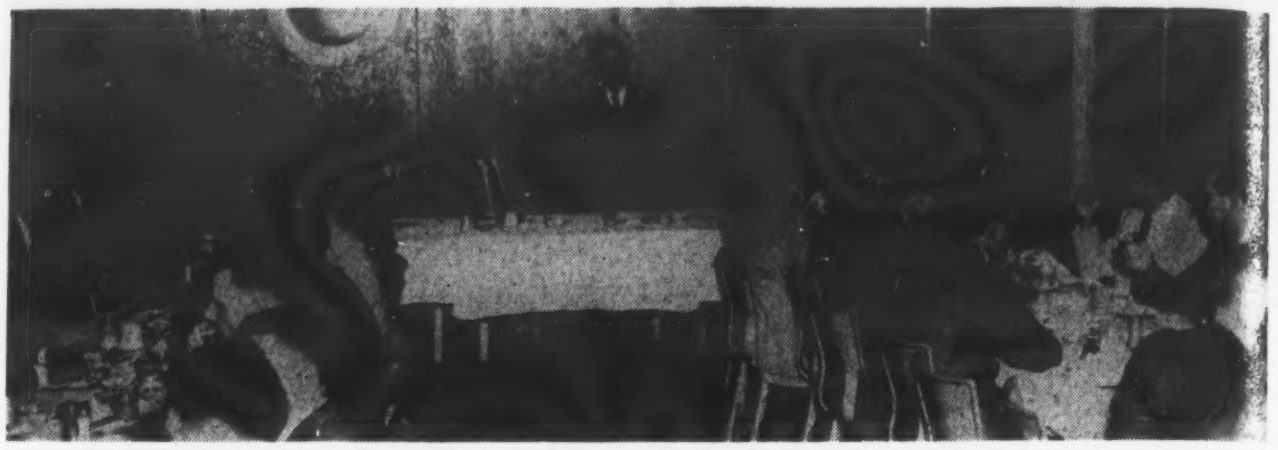
Decatur

Through the courtesy of the Zenith Radio Corporation, the chapter featured a program on "Phonevision" at its October 28th meeting, with Walter S. Druz, research engineer of Zenith as guest speaker.

Mr. Druz stated that there was a difference of opinion among various groups on the economic status of television in its present form. He pointed out that the movies are the hub of the entertainment business and that they are greatly concerned with television; in addition, sports promoters, college athletic directors and heads of national sports associations have found that television has a disconcerting effect on gate receipts.

The speaker said it was his company's contention that Hollywood someday will depend a great deal on furnishing film to television stations and that the answer to this is a "box office" in the field of television. Operating on this theory, Zenith has developed "Phonevision" in order that the box office can be secured. Permission was obtained to conduct an experiment in Chicago to bring "Phonevision" to a given number of homes selected at random. The necessary equipment was installed to bring the programs over the regular television sets on a subscription basis depending on usage.

Mr. Druz told his audience that the very favorable results of this experiment have convinced his company that this is the answer to securing a "box office" for television since there will be a potential of some 40,000,000 to 50,000,000 television sets in the country in a few years and since telephone service is available to this same group. On a subscription basis a good movie or play can be brought to the family at less cost than the theater, and the revenue derived from this source would be an incentive to Hollywood, the speaker said, to develop the best of entertainment for presentation through "Phonevision."



Gulf Coast Chapter meeting. Howard Van Zandt, standing, of Kellogg Switchboard & Supply Co., was the featured speaker.

With the aid of a film, Mr. Druz described in detail the technical phase of "Phonevision," the equipment required to convert the standard television set and the resultant improvement in the quality of reception. Although film was used in the test of "Phonevision," Mr. Druz explained that its use is not limited to film and that Zenith has successfully used studio camera chains and can just as easily use subject matter such as sports events or direct pickup of stage plays.

Chapter President Robert J. Bangert opened the meeting with an address on the history of the AFCA, dating back to its first predecessor organization, the United States Veteran Signal Corps Association formed immediately after the War between the States, and on the present-day aims and objectives of the Armed Forces Communications Association. The talk, which was based on an historical sketch of the AFCA written by George Dixon, national executive secretary, proved to be of as much interest to AFCA members present as to their guests. In writing to Col. Dixon after the meeting, Bob Bangert said many compliments had been received on the talk and that numerous members expressed appreciation for being given the interesting background of the association to which they belong.

The chapter's annual meeting held in December resulted in the election of the following officers for 1952: president—Louis Yack; 1st vice-president—Roman Wojcicki; 2nd vice-president—Capt. John R. Corcoran; secretary-treasurer—Chester Badgett; directors for two-year term—Robert J. Bangert, Elmer W. Cupp, Capt. Clarence M. McGowan; director for one-year term to fill unexpired term of Lt. Col. Alex W. Hazuda (transferred)—Herman K. McKenzie.

Detroit

A joint meeting with the Reserve Officers Association featured the General Motors Previews of Progress Show at the Michigan Central Terminal on November 7th. According to C. L. McCuen, general manager of General Motors Research Laboratories, "the pursuit of scientific knowledge is a search that never ends. Previews of Progress dramatizes this process in an unusual stage presentation that provides a glimpse into the workings of free men in a competitive society."

Some of the demonstrations were: the Sun motor; jet propulsion—including a model of the first jet engine developed more than 2000 years ago; search for light—75 years of progress in lighting, from first incandescent lamp to a tiny tube one-fifth as bright as sunlight; victory over vibration; glass with a temper; music on a light beam; etc.

AFCA members met for a pre-meeting dinner at Garon's Chop House.

Following up his introductory talk on atomic energy presented to the chapter in October, Dr. Henry J. Gomberg, assistant professor of electrical engineering, University of Michigan, and laboratory director of the Michigan Memorial Phoenix Project, dealt with "Instrumentation for Atomic Energy" at the December 13th meeting and explained the ways such energy can be released and the instrumentation for measuring it.

Special guest of the chapter was AFCA national executive secretary George Dixon who reviewed the history of the association and emphasized its aims and objectives in light of present day needs. He stressed the need for an active membership committee in all chapters, particularly in regard to increasing the number of group members in industrial cities as well as individual members. He complimented the chapter on the very fine program it has scheduled for the year and stated that there is evidence of a great deal of interest in the association among its officers and members. However, he felt a city like Detroit should have a much larger AFCA chapter and many more group members.

George Goldstone, chapter vice-president, has recently been named chairman of the membership committee and has already started on a vigorous campaign.

Fort Monmouth

Dr. J. O. Perrine, a familiar figure in the past to many AFCA chapters, addressed the opening meeting of the Fort Monmouth Chapter on October 10th. His lecture on the "Time Factor in Communications" was illustrated with slides and was presented in his customary easy-to-understand manner

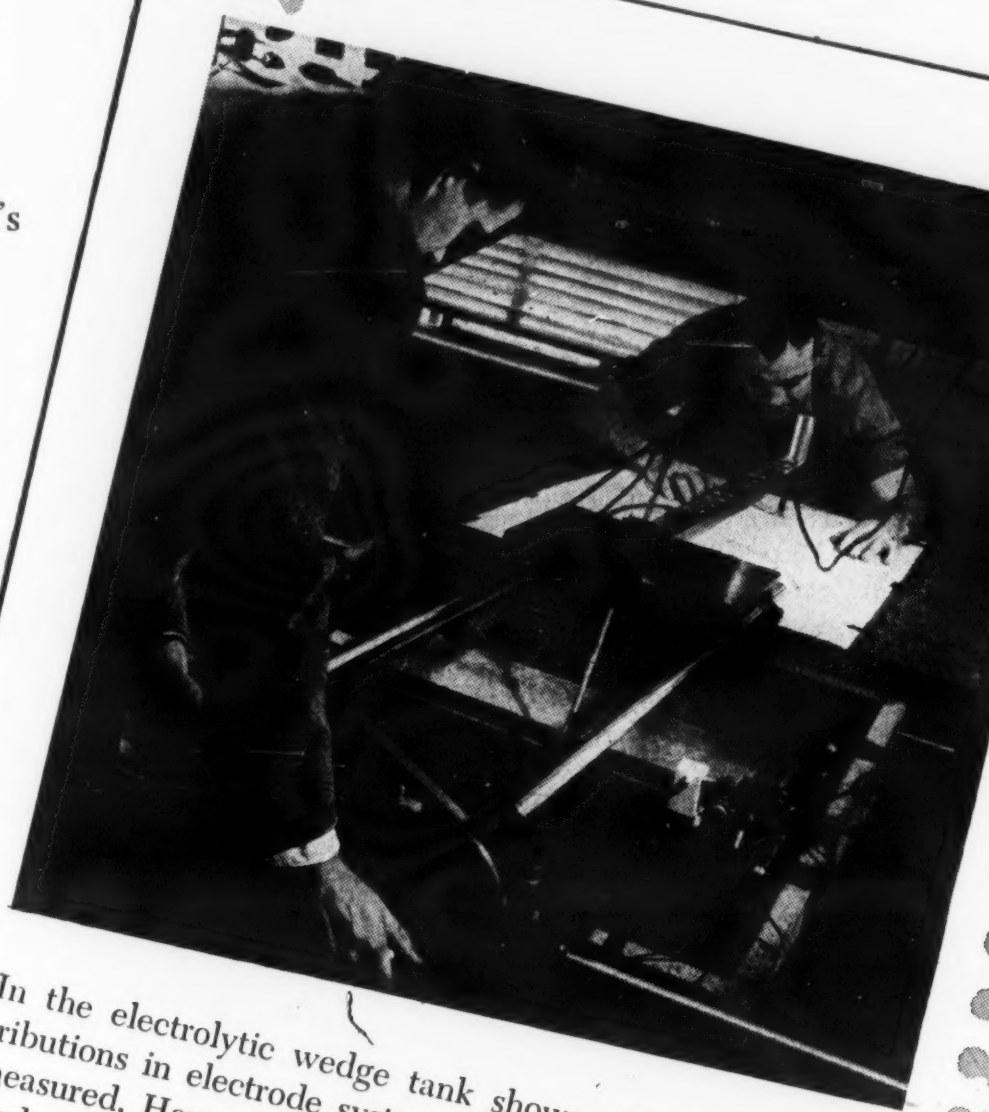
A page from the note-book of Sylvania Research

Pre-Determining CRT Electrode Configurations Saves Experimental Costs

An electrolytic tank and an ingenious plotting system give engineers at Sylvania's Research Laboratories great flexibility in the design of electron guns for cathode ray tubes.

An enlarged scale model of a vacuum tube electrode system is immersed in an electrolyte and voltages in proper ratio are applied to the electrodes. The potential distribution which results is that of the original electrode system in the vacuum tube.

With this tank various electrode configurations can be investigated and results plotted without expensive and time consuming assembly of endless sample tubes. With data gathered desired tubes having predetermined characteristics can be constructed for further tests. Development of such methods and equipment by Sylvania contributes much to the continuous improvement of Sylvania cathode ray tubes for television and other applications.



In the electrolytic wedge tank shown, the potential distributions in electrode systems of rotational symmetry are measured. Here, the sides of a wedge section of the electrode system are represented by the top and bottom surfaces of the water; the axis, by the water line; the cylindrical electrodes, by flat electrodes (as the wedge angle is small).

SYLVANIA

Sylvania Electric Products Inc., 1740 Broadway, New York 19, N. Y.

TELEVISION PICTURE TUBES; ELECTRONIC TEST EQUIPMENT; ELECTRONIC PRODUCTS; RADIO TUBES; FLUORESCENT TUBES, FIXTURES, SIGN TUBING, WIRING DEVICES; LIGHT BULBS; PHOTOLAMPS; TELEVISION SETS

which has fascinated and enlightened numerous AFCA audiences.

More than two hundred members and guests gathered at Gibbs Hall for a social hour and buffet dinner prior to the meeting. Col. Eugene A. Kenny, chapter president, welcomed the many new members present and expressed the hope that they would enjoy their active membership in the AFCA and take an active part in chapter activities. Guests of the chapter were two members of AFCA's New York Chapter: Col. Rolf Dallmer and Col. Archie L. Hoke.

The entertainment portion of the program was turned over to Lt. Col. Francis E. Bierstadt, chairman of the meetings committee, who acted as master of ceremonies. The entertainers were from the post and were very well received by the members and guests.

The chapter's annual meeting on November 30th featured Mr. P. R. Everitt, patron system engineer of the Western Union Telegraph Company, who gave an illustrated lecture on the Western Union Plan 51 switching system. Mr. Everitt is the engineer in charge of the work on this Plan 51 for the Air Force and gave a most interesting and clear picture of the project.

The annual election retained in office all the present officers and board of directors. The officers re-elected are: president—Col. Eugene A. Kenny; 1st vice-president—Lloyd F. Christianson; 2nd vice-president—M/Sgt. Tom C. Clark; secretary—Lt. Col. Ernest E. Knight; treasurer—Miss Esther M. Ferneau. On behalf of the officers, Col. Kenny thanked the chapter members for their confidence and expressed his ideas for more interesting and educational programs for the coming year.

Lt. Col. Charles S. Lacey, wire branch, officers' dept., TSS, has been appointed chairman of the membership committee and will soon launch a drive for new members.

European

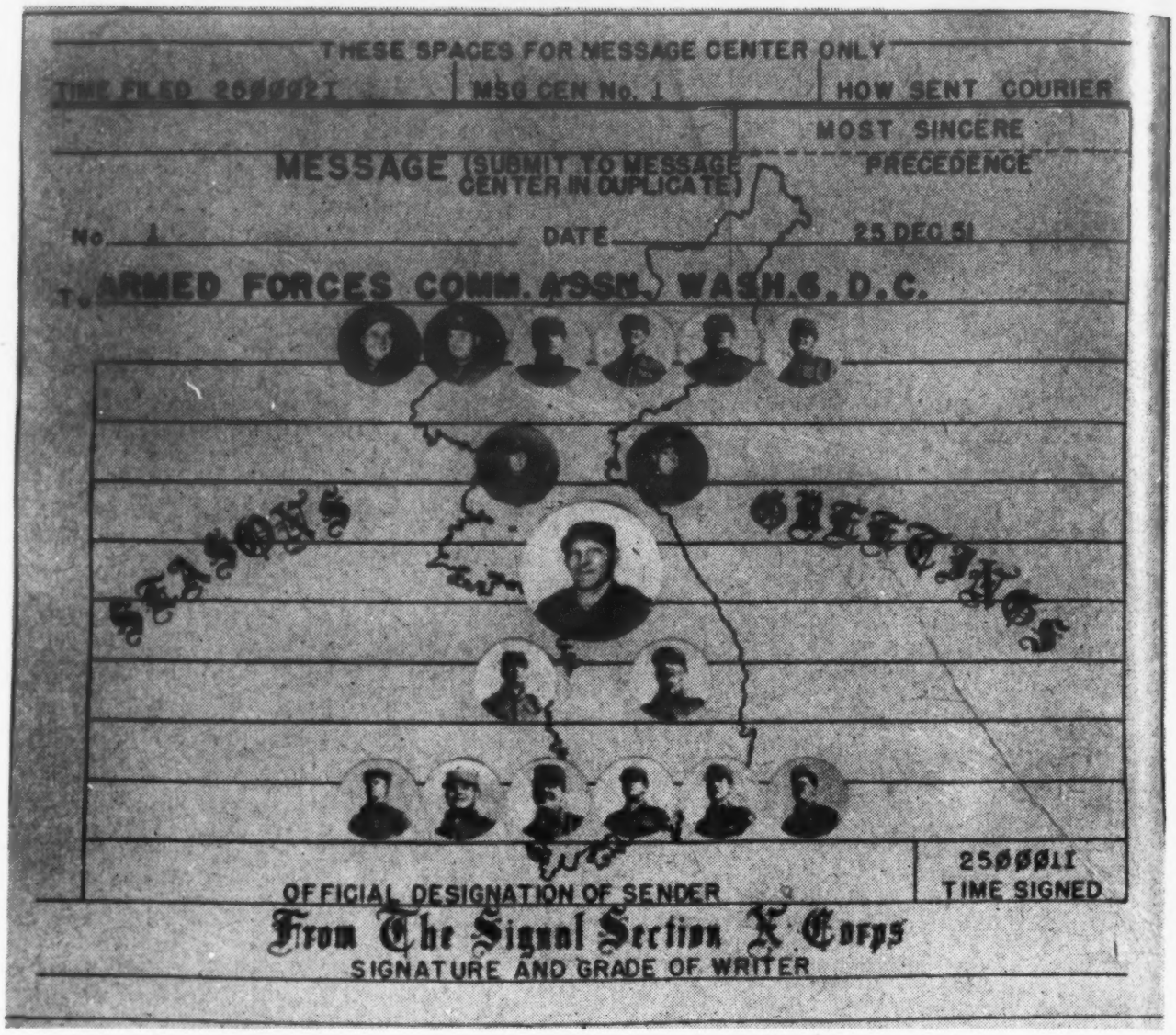
Headquarters was informed by the chapter some months ago that plans were being made for a meeting in the fall, but to date no report of the meeting has been received for use in SIGNAL.

Far East

As SIGNAL went to press, word was received from Brig. Gen. Elton F. Hammond, signal officer, FEC, that a general meeting of AFCA members in Tokyo has been set for January 31st at the Union Club.

Featured on the program will be speakers from the three services: General Hammond; Captain Caruthers, communications officer, Naval Forces, Far East; and Colonel Hoffman, director of communications, Far East Air Forces. Lt. Col. Robert M. Johnson, SigSec, GHQ, FEC, who is acting secretary-treasurer of the Far East Chapter and its Tokyo Post, will conduct the meeting and the election of officers of the Tokyo Post. The first duty of the new Tokyo Post officers will be to arrange an election of officers to represent the Far East Chapter as a whole.

Reports from posts of the Far East Chapter indicate that the Okinawa and Philippine Posts are again active, the Sendai Post (XVI Corps) is being organized, and plans are being made to reactivate the Guam Post under Navy sponsorship.



—AFCA Hqs received the above clever Christmas card from Col. Henry Hort, X Corps signal officer. Hort, shown in center of photo circles, was president of the AFCA Augusta-Camp Gordon Chapter in 1950.

Gulf Coast

Western Union's program "A Century of Progress" was presented before the chapter on October 19th, with Mr. Thomas Taylor, sales manager of Western Union's New Orleans office and a member of AFCA's Louisiana Chapter, as guest speaker.

With the use of slides, Mr. Taylor described the development of the telegraphic science from Sam Morse's simple apparatus to the very latest field test of a cruiser car which, equipped with teleprinters, shortens the time lapse between receipt and delivery of messages. Another Western Union man, Mr. W. M. McCormick, field representative of the plans and methods section, answered technical questions at the conclusion of the demonstration.

A magician act from Entertainment, Inc., of Koesler AFB, entertained during dinner.

The chapter's November 19th meeting featured Howard Van Zandt of Kellogg Switchboard and Supply Co. and his lecture on "Adventures in Telecommunications in Japan." His talk was spiced with amusing incidents which arose during the rehabilitation work on the Japanese communications system but he stressed the point that international complications can result, and have resulted, from misunderstandings of the language and customs of one people by another. As an example, he illustrated the unfavorable impression one might get from a friendly courteous message which has been translated as well as paraphrased, encoded and decoded, and the audience was made aware of the need for caution and patience in dealing with Asiatic communications systems and the advisability of using multiple interpreters who can check each other for errors.

An enlightening talk on the military and economic situation involved in the relationship between the United Nations and Communist countries, and a demonstration of Bi-Noral recordings added up to a most interesting chapter session on December 10th.

Col. J. G. Mayton, USAFR, who gave the talk, has lived and traveled extensively in Japan, China, Manchuria and Europe, and recently returned from tours of active duty in Germany where he served as intelligence officer for the Air Force and held several positions in the military organization. At present he is professor of economics, University of Georgia, Atlanta division.

Mr. Earl Lipscomb of Lipscomb Associates, Dallas, Texas, assisted by one of his representatives, conducted the

Pittsburgh Chapter meeting at Carnegie Tech ROTC Armory featured demonstration of combat signal equipment by student section of the chapter. In photo, right, Brig. Gen. Arthur Pulsifer, chief, personnel and training, OCSigO, arrives at the airport to attend the meeting. L to R: Major E. G. Williamson, Asst. PMS&T; Fred E. Moran of Western Union, former president of the Pittsburgh Chapter, and once president of the AFCA Baltimore Chapter; S. C. Stoehr, Jr., of Bell Tel. Co. of Pa., president of the Pittsburgh Chapter; Capt. H. R. Smith, Asst. PMS&T; and General Pulsifer.

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demonstration of Bi-Noral recordings. This was followed by a demonstration of many varied types of electronics equipment, including oscilloscopes, oscillographs, counters, etc., manufactured by various concerns in the U. S.

A record attendance of eighty-six members and guests turned out for the meeting. A pantomine act provided entertainment during dinner.

The interest aroused by Col. Mayton's lecture was so great that the chapter prevailed upon him to give a supplementary talk at a special meeting on December 14th. The additional information was very well received by the members and Col. Mayton conducted a lively question and answer period at the conclusion of his talk.

Kansas City

Temporary officers were chosen recently to head the Kansas City Chapter in its organizational period. They are: president—C. L. Foster of the Central Radio and Television School; secretary—Col. R. E. Conrath, long lines department, AT&T Co.; treasurer—Lt. Col. C. G. Turner, electronics department, General Electric Co.

Kentucky

The experiences of an infantry regimental commander in Korea were related at the chapter's October 26th meeting by Col. Charles M. Mount, Jr., who had recently returned from a tour of duty in that area. He described the problems of supply and evacuation in Korea, both of which were aggravated by lack of roads. Bulldozers were used to build temporary roads and Koreans were used to carry supplies and ammunition to troops and to take the wounded to safety. Col. Mount said the communications equipment was found to be very satisfactory.

The Eastman Kodak Company color and sound film "Functional Photography in Industry" was shown to the audience of 125 members and guests, and was followed by a movie of the Kentucky-Kansas basketball game.

Kentucky Chapter meeting, Col. Harold T. Gallagher, chapter president, addressing the gathering of members and guests.

The November 14th meeting inaugurated a new phase of chapter activity. The enthusiasm of the members since the reactivation in September has been such that it was decided to hold weekly luncheon meetings instead of monthly dinner meetings. Attendance at these meetings has since attested to the success of this plan, with an average turnout of 125. Each luncheon is opened with a report of late news headlines and the introduction of new members and guests present. A speaker is featured at each meeting. To equalize the task of providing suitable program material for the numerous meetings, a new program chairman is appointed each month.

At the November 14th meeting, Col. Harold T. Gallagher, chapter president, gave a talk on the purposes of the association and the benefits of membership in it. He explained that the second World War brought home the fact that this country could no longer merely think that science and industry should be included in preparedness—they have to be. In order to accomplish this, it was necessary to have the partnership of officers and civilians of the military and civilians in industry which would serve to continue in peacetime the work and cooperation achieved in wartime. He said that the supremacy in science and industry is necessary to victory and that both will have to be prepared fully as much as the armed forces.

Lt. Granville F. Miller, officer in charge of the Air Force Filter Center in Lexington was guest speaker and explained the operation of the new aircraft filter center. He pointed out that 800 volunteers would be needed to operate the filter center during wartime and that the present aim was to get people trained, should war come. He said that 200 observation posts have been set up eight miles apart in the Lexington area and that, in the event of war, observers would man their

Temporary officers of recently organized Scott Field-St. Louis Chapter. L to R: Col. G. Edwin Popkess, Jr., 1st v.p.; Allan L. Eisenmayer, treas.; Lt. Col. George S. Walborn, pres.; M/Sgt. R. L. Oase, secty; and Howard D. Yund, 2nd v.p.

CHAPTER NEWS

posts and phone sightings into the filter center which would register the progress of the flight on plotting boards.

Vice President Harry Bradshaw presided at the November 21st luncheon in the absence of Colonel Gallagher. Mr. J. B. Faulconer, local sports announcer, gave a very interesting talk on the forthcoming Kentucky-Tennessee football game. He pointed out that these games had been played every year, except during war years, since 1893, thus making the rivalry the oldest in gridiron history. He paid tribute to the Kentucky team and to Coach Bryant.

A history of the Kentucky Telephone Corporation was presented at the November 28th meeting by D. H. Lloyd, secretary-treasurer of the company. He said the company began in the early 1880's and, for a period of time, Lexington had two separate telephone companies. He traced the development of the local company, citing the changeover to the dial system in 1949. At the present time, the Kentucky Telephone Corporation serves some 22,000 customers.

Claude Sullivan, sportscaster for radio station WKL, Lexington, was the chapter's guest on December 5th. After a general sports summary, he discussed the University of Kentucky football and basketball activities. It was his opinion that the basketball scandal would not hurt basketball as he believed the sport was too well founded for that.

The vital role radio plays in the operation of an air field was described at the December 12th luncheon by guest speakers Charles Scott and Otto Schmidt from the Blue Grass Air Field. They stressed particularly the clearances made for planes to land or take off, and the charting of routes. Scott is the control tower operator at Blue Grass Air Field and Schmidt is in charge of communications.

Chapter Secretary Clyde Burke reported on the standings in the "Chapter of the Year" contest which now showed the Kentucky Chapter in first place.

In tune with the holiday spirit, Santa Claus, played by George Staed of the chapter entertainment committee, paid a surprise visit to the December 19th meeting. Gifts were distributed and letters were read from officers and civilian employees of the post. As customary, new members and guests were introduced by Major Norman Miller, chairman of the membership committee.

Herbert Fritz, city manager of Lexington ,brought the chapter up to date on local civil defense activities at the January 10th meeting. He said he believed the personnel of the Lexington Signal Depot, being vitally interested in national defense, were more cognizant of the need for a sound civil defense plan than the by-and-large public in Lexington who had no such contacts. He reported that Lexington's plan for civil defense was still in the beginner's stage—mostly on paper—but the urgent need for planning an organization now is keenly realized. "When the chips are down," the speaker said, "any emergency must be met by the people themselves through organizations which have already been trained and oriented."

Mr. Fritz stated that communications play a very important part in the welfare of a city, even in normal times, and that their importance would be greatly increased should an emergency arise.

Allan L. Eisenmayer, Scott-St. Louis Chapter treasurer, receives AFCA honor award medal from the chapter president, Col. G. S. Walborn. Eisenmayer's membership campaigning was credited as mainly responsible for the new chapter's 167 charter members.

Louisiana

New Orleans on November 20th was fourth in the series of lectures by Howard Van Zandt of Kellogg Switchboard and Supply Company before AFCA chapters. His talk "Adventures in Telecommunications in Japan" was received by the Louisiana Chapter with the same enthusiasm which was accorded him by the other chapters.

Prior to the meeting at the St. Charles Hotel, a dinner was given for the working committee and officers of the newly reactivated chapter by Charles Pearson, Jr., New Orleans district manager of the Southern Bell Telephone and Telegraph Co. Present were representatives of industry and of all the armed services in the area. Col. Bruce Hay, chapter secretary, introduced C. James Briant of MGM, the new chapter president, who called on Col. George Dixon, AFCA national executive secretary, for an up-to-date report on association activities. This was followed by a general discussion and much interest was displayed by the Army, Navy, Air Force and Coast Guard electronics people.

Among the guests present were: Ralph Grist, AFCA Southeastern area

The words he spoke then... hold the wisdom to guide us now

"Property is the fruit of labor; property is desirable; it is a positive good in the world. That some should be rich shows that others may become rich, and hence is just encouragement to industry and enterprise.

"Let not him who is houseless pull down the house of another, but let him work diligently and build one for himself, thus by example assuring that his own shall be safe from violence when built."

Lincoln had a direct way of getting to the truth—with words just as applicable today as when he uttered them. Those who create wealth create prosperity for others by rewarding them in proportion to their efforts. This can only be done if these creators of wealth are allowed to function properly, unhampered by too many foolish or needless restrictions.

Walter E. Dittmars President

The Gray Manufacturing Company, Hartford, Connecticut

makers of the Audograph Electronic Soundwriter

Louisiana Chapter meeting. L to R: Howard F. Van Zandt, Kellogg Switchboard; Col. G. P. Dixon, AFCA executive secretary; Ralph Grist, Southern Bell Tel. & Tel.; Bruce Hay, also of Southern Bell, and secretary of chapter; Father Benedetto, S.J., head of physics dept., Loyola University of the South; Dr. Jos. C. Morris, executive v.p. and head of physics dept., Tulane University; C. James Briant of Metro-Goldwyn-Mayer, chapter president; and Col. John A. McDavid, president of the AFCA Gulf Coast Chapter.

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representative; Dr. Joseph C. Morris, executive vice president of Tulane University; Father Benedetto, S.J., head of physics dept., Loyola University; and the following officers of the Gulf Coast Chapter: Col. John McDavid, president; Lt. Col. Edwin Wood, vice-president; Capt. Richard Deane, secretary; and Curtis Hollister, treasurer.

New York

October 31st was "FCC Night" for the New York Chapter, with Commissioner George E. Sterling of the Federal Communications Commission as guest speaker.

Commissioner Sterling discussed the present television situation in the U. S. with particular respect to its effect on the public and industry. He gave a comprehensive report on television including its early history and subsequent developments as they were presented to the FCC during the past 15 years. The rapid growth of television and its importance to the public interest was particularly stressed. The new UHF television channels will soon bring television to urban and rural areas which are out of range of the present VHF stations. This would further increase the potential educational and entertainment value of television, the speaker pointed out. He also reported that there are approximately 14,000,000 television sets in the United States at present, which tends to further complicate the compatibility requirement of color television.

The meeting was held jointly with the Atlantic Section of the Institute of Navigation. Chapter President Ellery W. Stone presided and introduced Commander Victor Tyson of the Merchant Marine Academy and president of the Atlantic Section of the Institute of Navigation, and other distinguished guests including: FCC Commissioner E. M. Webster, E. R. Shute, vice president of Western Union Telegraph Company, F. M. Ryan of AT&T; and Col. F. E. Herrelko, communications officer, Eastern Air Defense Force.

One hundred thirty members attended the meeting at the 71st Regiment Armory.

The Western Union Telegraph Company was host to the chapter for its November 28th meeting. The program feature was an illustrated discussion on "Technical Progress in American Telegraphy" by Col. Julian Z. Millar, director of reseach for Western Union.

Colonel Millar showed various colored slides and described installation of the new under-water repeaters used by Western Union on their cables between the U. S. and Europe. These repeaters contain a number of vacuum tubes which have life expectancies of ten years or more. Western Union's new facsimile equipment also was described with photographs illustrating its use for various applications. One small model can be installed on a desk and a telegram, handwritten or typewritten, can be inserted on its small cylinder and transmitted within two to three minutes by the Western Union office; in addition, telegrams may be received on it from Western Union.

Recent centralized telegraphic installations made for the armed forces were described; these included tape relays and automatic re-transmission of messages. It was made evident to all present that electronics has greatly advanced the art of wire telegraphy and has increased the message handling capacity of telegraph wires many times. A brief description of Western Union's microwave relay equipment was also given by Colonel Millar.

Some 150 members and guests assembled in the cafeteria of the Western Union Building, 60 Hudson Street, for a turkey dinner prior to the meeting. Introduction of the following Western Union officials was made by Chapter President Ellery Stone: E. R. Shute, vice president, operating department; H. P. Corwith, vice president, development and research department; J. W. Rahde, vice president and comptroller; G. B. Saterlee, secretary; W. P. Waters, treasurer; and D. P. Dickie, director, contract department.

Nominees for chapter officers for 1952 were submitted by George W. Bailey, chairman of the nominating committee, for consideration at the annual election to take place at the December meeting.

A most interesting discussion and demonstration on "Unusual Applications of Cathode Ray Tube Devices" was presented by Carl Berkley, head of application engineering division of Allan B. DuMont Laboratories, at the chapter's December meeting. He described the many hundreds of uses of the cathode ray tube or oscillograph to measure voltages, currents, phase shift, etc.

Cathode ray devices are now used extensively in industry as well as for military purposes to make computations not normally possible by the use of other devices. For example, the oscillograph can be used to detect radio activity in metals of minute particles of matter. In the manufacture of cotton cloth, normally performed by several machines, the oscillograph can be used to check on the proper adjustment of the shuttleboards, which permits a greater uniformity of the threads. The accuracy of teeth on gears can be easily checked by means of the cathode ray tube, and the sharpness of edges on razors can be verified by the oscillograph. The proper operation of gasoline engines, as in an automobile, can be seen displayed on the oscillograph as a function of the firing of the cylinders. The oscillograph also may be applied to chemical processes to con-

of the operations or check on the consistency of the chemicals.

Mr. Berkley concluded his discussion by showing an unusual motion picture film taken of various displays of cathode ray tubes as an indication of what the future might hold in the many uses of this device.

The following chapter officers and directors were unanimously elected for the year 1952: president—Col. T. L. Bartlett, RCA; vice-presidents—Vice Adm. W. S. Anderson, International Automatic Electric Co.; Col. Frank E. Kidwell, signal officer, First Army; Herbert J. Schroll, AT&T Co.; treasurer—Maj. T. N. Pope, Bell Telephone Labs; secretary—Lt. Col. David Talley of Federal Telephone & Radio Corp.; recording secretary—Royal F. Jewett, Western Electric Co.; member, executive committee—Rear Adm. Ellery W. Stone, All America Cables & Radio Corp. Board of directors: G. W. Bailey, C. O. Bickelhaupt, E. C. Carlson, R. B. Colton, W. L. Hallahan, H. C. Ingles, F. R. Lack, A. W. Marriner, T. H. Mitchell, S. F. Patten, V. N. Philip, W. H. Rivers, E. R. Shute, E. W. Stone, S. M. Thomas and A. W. Wharton.

Guests at the meeting included Capt. Richard Hallahan, recently returned from 16 months in Korea; Maj. Gen. Roger B. Colton, president, Federal Telecommunications Labs; Forest L. Henderson, executive vice president and C. E. Scholz, vice president and chief engineer of All America Cables and Radio.

Donald F. McClure, New York Telephone Co., has been appointed chairman of the membership committee, with Edwin C. Carlson, Mutual Life Insurance Co., as chairman of the subcommittee for related companies. Ludwig R. Engler, RCA Communications, heads the meetings committee.

Philadelphia

A capacity audience of 300 filled the auditorium of the Franklin Institute in Philadelphia November 1st to hear Rear Admiral Joseph R. Redman, USN (Ret.), discuss "The Air Forces Communications Network" recently provided by the Western Union Telegraph Company. Philadelphia chapters of both the AFCA and IRE met for the occasion.

Since 1946, Admiral Redman, World War II Chief of Naval Communications, has been a vice-president of Western Union and his talk covered the equipment and outside plant facilities which provide the Air Forces network.

He described the nationwide facilities of the Western Union Telegraph Company, including their ventures into the carrier and microwave field as additions and substitutes for the conventional plant currently used for telegraph transmission. He then told his interested audience, in a more detailed manner, of the system provided by his company for the Air Forces which comprises a network containing over 200 stations and over 128,000 circuit miles.

Harry Ehle, president of the AFCA chapter, acted as joint chairman and introduced the speaker. Col. George Dixon, national AFCA executive secretary, also addressed the group and gave a report on the activities of the association and its chapters throughout the country.

Prior to the meeting, about 130 persons attended a "Meet the speaker" cocktail party and dinner in Franklin Hall of the Institute. Col. W. Preston Corderman, new commanding officer of the Signal Corps Procurement Agency in Philadelphia, was introduced at the dinner.

Pittsburgh

The chapter entertained its membership with a "good fellowship" evening at the North Park Lodge on October 23rd.

This meeting deviated from the usual pattern but the chapter reports it aided greatly in getting new members acquainted.

A barbecue supper was followed by the latest films on the Korean war. Forty-eight members and guests were present.

A demonstration and explanation of signal communications in front line combat infantry divisions was given at the Carnegie Tech ROTC Armory on November 14th by the Carnegie Tech student section of the Pittsburgh Chapter. Distinguished guest of the chapter was Brig. Gen. Arthur Pulsifer, chief of personnel and training, OCSigO.

The demonstration included the "Walkie-Talkie" and "Handie-Talkie" radios, 600-watt division radio set, sound powered fox-hole telephone, coat-pocket telephone switchboard (SB-18/GT), and multi-channel telephone and telegraph carrier equipment. In addition, there was a display of photographs portraying the work of Signal Corps photographers in Korea and Signal Corps research and development at Fort Monmouth laboratories.

Sixty-two members were present for the meeting at Carnegie Tech. Prior to the meeting, a dinner was held for General Pulsifer at the William Penn Hotel, where eighteen of the members renewed their friendship and became better acquainted with General Pulsifer and his continuing efforts to increase the efficiency of training for the rapidly expanding Signal Corps.

The officers of the Carnegie Tech student section of the Pittsburgh Chapter are: president—E. W. Yorkison, electrical engineering senior and cadet adjutant of the ROTC regiment; vice-president—R. J. Lechner; secretary—E. D. Frankhouser; treasurer—J. G. McElhaney.

Lt. Col. Joseph C. Rively, recently returned from 13 months' service with the G-4 staff of the Eighth Army in Korea, addressed the December 11th meeting held in the Bell Telephone Company auditorium.

His talk on "The Civil Affairs Aspect of the Korean Action" proved to be so interesting that it generated a lively forum at its close, with Colonel Rively answering and discussing the many questions asked by the members.

Refreshments were served during the meeting through the courtesy of the Bell Telephone Company.

Rochester

Eighty-five members and guests of the Rochester Chapter attended the luncheon meeting on November 6th in the Victorian Room of the Sheraton Hotel. Guest speaker was Nathan D. Golden, chief of NPA's motion picture and photographic products division, who spoke on the outlook for the coming year with respect to materials allocations. (Details of his talk were reported as last minute news in the November-December issue of SIGNAL, p. 68.)

Special guest of the chapter was William C. Babbitt, executive secretary of the National Association of Photographic Manufacturers.

A camera capable of slowing motion of a high-speed rocket was demonstrated at the chapter's December 12th

Recent Philadelphia Chapter meeting featured as speaker Rear Adm. Joseph R. Redman, USN, ret., now a vice president of Western Union

meeting by John H. Waddell, manager of the industrial and technical photographic division of Wollensak Optical Company. The camera, developed in the Bell Telephone laboratories for testing and improving equipment, has been completely redesigned since acquired by Wollensak, Mr. Waddell said, and is now in heavy demand by the armed forces and industries. It is currently in production under the trade name of Fastax and company officials claim it is the world's fastest moving film camera.

Pictures taken with the highspeed camera were shown, including a living heart in action and the "atomic-like explosion" caused by a drop of cream falling into a cup of coffee. These films, taken in one second, required 200 seconds on the screen, thus revealing what the eye alone could not detect.

In designing the camera, Wollensak has gone out into the field to meet actual problems, the speaker emphasized, adding that it has speeds from 150 to 7,000 feet a second. Present goals, he said, include speeds four times as great and use of 35mm film instead of 8mm, giving the camera almost unlimited possibilities in its field.

Guests of the chapter at the luncheon meeting were an armed forces group of thirty-five high speed camera technicians from all major proving grounds and test installations who were attending a week-long symposium on high speed photography sponsored by Wollensak Optical Co.

Sacramento

A number of new developments in Signal Corps equipment, including the new infantry radio set AN/PRC-10 which replaces the old walkie-talkie set, were explained and demonstrated by Major X. M. Godfrey and Capt. John Buechner of the Sacramento Signal Depot at the chapter's October 23rd meeting.

Of particular interest to those members having a technical knowledge of radio and electronic equipment, the meeting was held at the Sacramento Signal Depot with fifty-six members and guests in attendance.

The Air Force Filter Center in the Sacramento Memorial Auditorium was the scene of the November 13th chapter meeting, with Major Lafayette French, commanding officer of the filter center as host. Details and operation of the filter center were explained and were followed by a tour of the installation. The center is operated by the Ground Observer Corps of the U. S. Air Force and is manned by civilian volunteers. The Ground Observer Corps detects and observes low flying aircraft within the continental limits of the U. S. and aids the radar installation in covering weak or blind spots in the net. Reports from observer posts are plotted on a large grid map in the filter center to show their respective location and then reported to the radar sites to be combined with more information on hand. The radar site takes necessary action which, in the case of enemy aircraft, would be the launching of interceptor planes.

One of the best meetings of the year ushered out the chapter's 1951 season of activities on December 11th, with Dr. Ransom T. Taylor of the University of California lecturing on "Germany in the Post-War World."

Dr. Taylor was well qualified to speak authoritatively on this subject, having lived and traveled abroad for over 17 years and having studied chiefly in Switzerland, Germany, Austria, France, England, Italy and Poland. A veteran of World War II, he also served for more than two years in the G-2 section of General Eisenhower's European headquarters.

A social hour and dinner preceded the meeting in the post restaurant of the Sacramento Signal Depot, with 105 members and guests present.

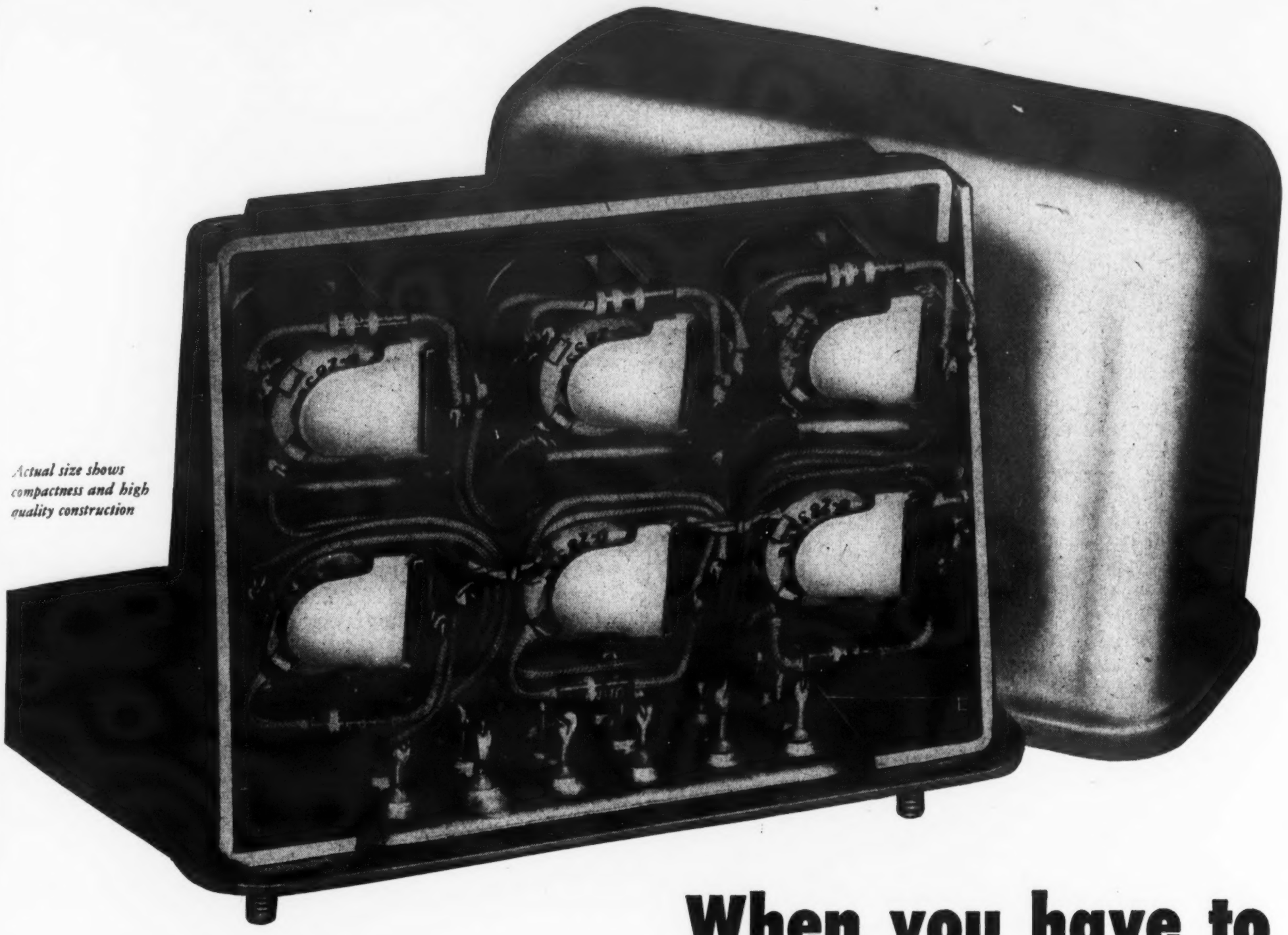
San Francisco

Chapter members were guests of the signal section, Headquarters, Sixth Army, on November 15th with Col. Lloyd C. Parsons, signal officer, acting as host. An extensive tour of the signal installations followed the dinner-meeting at the officers' mess, Presidio of San Francisco.

In welcoming the eighty members and guests present in the Presidio officers' mess (one of the oldest buildings on the West Coast, having been built in 1776), Colonel Parsons recalled the meeting in Stilwell Hall on February 10, 1948, of a small group of reserve officers who petitioned the AFCA for a chapter charter, and described the growth of the association since that time. He reviewed the purposes of the AFCA and stressed the importance of communications. After describing the mission of the signal section, Sixth Army, he turned the meeting over to Lt. Col. C. E. Taylor who outlined the tours to be made to the Gillette Pictorial Center, the AAG transmitting station, the AAG control station, the MARS radio station, and the communications center.

The communications center of the Sixth headquarters is the primary Army relay center of the Army command and administrative network in the Western area of the U. S. The AGAN operations of the headquarters is only surpassed by the Pentagon. With its far flung radio and wire network it is a major link in providing teletype service to the national military establishment throughout the world. Included in this system is the Department of the Army radio station AAG, with transmitters and control room located at the Presidio, which has direct circuits to

San Francisco Chapter members were guests of signal section, Sixth Army, during recent meeting. L to R: Harry E. Austin of RCA, the chapter president, addressing the meeting; Col. Lloyd C. Parsons, signal officer, Sixth Army; Col. H. L. Schnoor, chapter executive committee. In photo at right, members are shown touring installation where signal center methods are explained by Capt. W. R. Graver.



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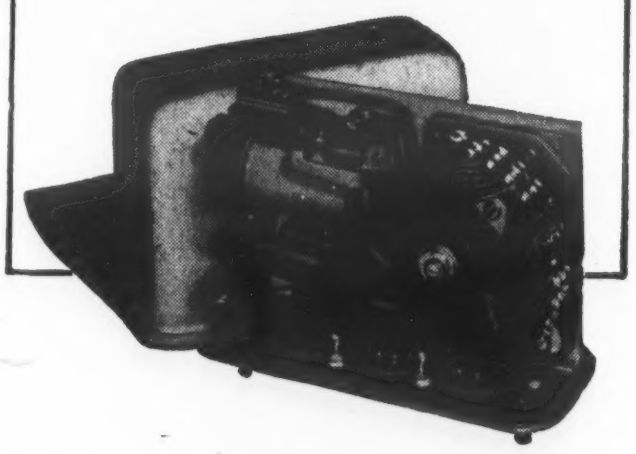

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CHICAGO

Washington, Seattle, Honolulu and Tokyo; and teletype communications to Armed Forces installations throughout the eight western states which comprise the Sixth Army area.

The MARS station, A6USA (W6-USA), located at Sixth headquarters is the heart of the MARS organization in the Sixth Army area.

At the Gillette Pictorial Center, a film library of movie training films, and film strips, is maintained for loan to installations and activities through the Army area. A stock of approximately 10,000 movie training films is maintained for such distribution, and excellent facilities are available at the center for film preview. The center also provides photographic coverage and produces still photographic prints and slides. Currently, over 2,500 still prints are produced per week.

At a brief business meeting, nominees for chapter directors for the year 1952 were submitted by Col. H. L. Schnoor, chairman of the nominating committee, as follows: William R. Patton, Lenkurt Electric Co., Lt. Comdr. Sydney N. Barton, Mackay Radio & Telegraph Co.; C. L. Wickstrom, Pacific Telephone & Telegraph Co.; R. J. Loveland, California Water & Telephone Co.; Russell H. Cobb, Western Union Telegraph Co. There were no additional nominations from the floor, and the nominations were closed.

Scott-St. Louis

The Scott-St. Louis Chapter formally became a member chapter of the AFCA at a dinner meeting in Belleville, Ill., on December 10th. Col. George P. Dixon, national AFCA executive secretary, presented the charter of the new chapter to Lt. Col. George S. Walborn, its president pro tem. The chapter was organized through the efforts of Colonel Walborn and other Scott Air Force Base personnel and includes in its area the former St. Louis Chapter. Col. G. Edwin Popkess, Jr., of East St. Louis, formerly president of the old St. Louis Chapter, acted as advisor to Col. Walborn and his working committee.

Colonel Dixon gave the one hundred and thirty members present a very interesting and informative history of the association, tracing its activities from immediately after the war between the states up to the present time. He stressed the objectives of the association and reported on activities of other chapters throughout the country.

The feature speaker was Fritz Franke of the Hallicrafters Company who discussed design and production problems and the techniques normally used by a manufacturer to solve them in the construction of communication and electronics equipment. To illustrate, Mr. Franke described two receivers currently being manufactured by Hallicrafters under government contracts and pointed out certain peculiarities in the mechanical and electrical design and construction of the equipment. He also gave a brief account of the activities in which Hallicrafters presently is engaged while producing communication and electronics equipment for the Department of Defense.

Following his talk on equipment manufacture, Mr. Franke related some of the experiences encountered during the Gatti-Hallicrafter expedition to Africa about two years ago. His description included the important radio communications and photography activities of the expedition and the part played by the Hallicrafters Co. as sponsor.

Mr. Franke said that several thousand "on-the-air" contracts had been made by the expedition's "rigs" with hams all over the world, followed by the customary exchange of QSL cards. He asked that any ham who had been contacted and did not receive a QSL card from the expedition's radio communications section should write Hallicrafters giving his or her name, location, call letters and the time and date of contact. Following a check of the station log, Hallicrafters will send the ham a card. He said they expected they had made some unintentional mistakes and were very much interested in correcting them.

After the lecture, Mr. Franke showed a technicolor sound movie "African Adventure" which gave an excellent picture of the "wilds of Africa" and the activities of the members of the expedition. The audience felt the film was an outstanding example of what the photographic industry has given to the world in the way of photo equipment and techniques associated with its use.

The superb and untiring efforts of Allan "Pappy" Eisenmayer, chapter treasurer pro tem and chairman of the membership and public relations committee, largely were responsible for the 167 charter members. In recognition of "Pappy's" sales acumen and one-man membership drive, Lt. Col. Walborn formally presented him with the AFCA honor award medal. The total membership had reached 190 on the night of the meeting; an additional 22 members also have been added to the chapter from the deactivated St. Louis unit. Other chapter officers pro tem are: vice-president—Col. G. E. Popkess, Jr.; secretary—M/Sgt. Robert L. Oase.

Seattle

The Signal Equipment Company of Seattle furnished the program for the chapter's Nov. 14th meeting. Mr. James F. Johnson, who acted as program chairman, discussed man-made radio interference and its elimination with special reference to an investigation being made by his organization under a Navy contract. This investigation covers the determination of the sources and magnitudes of man-made interference and methods of its elimination or suppression.

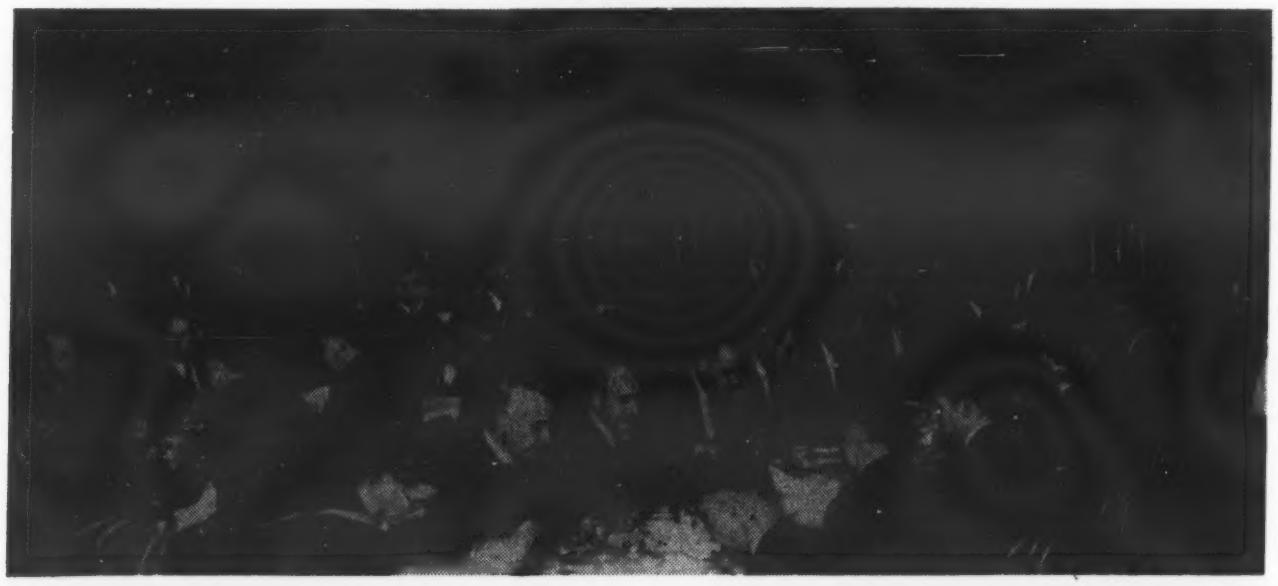
Mr. Jack Cozine, an engineer on the project, discussed the process of measuring interference and described and demonstrated the equipment used for this purpose.

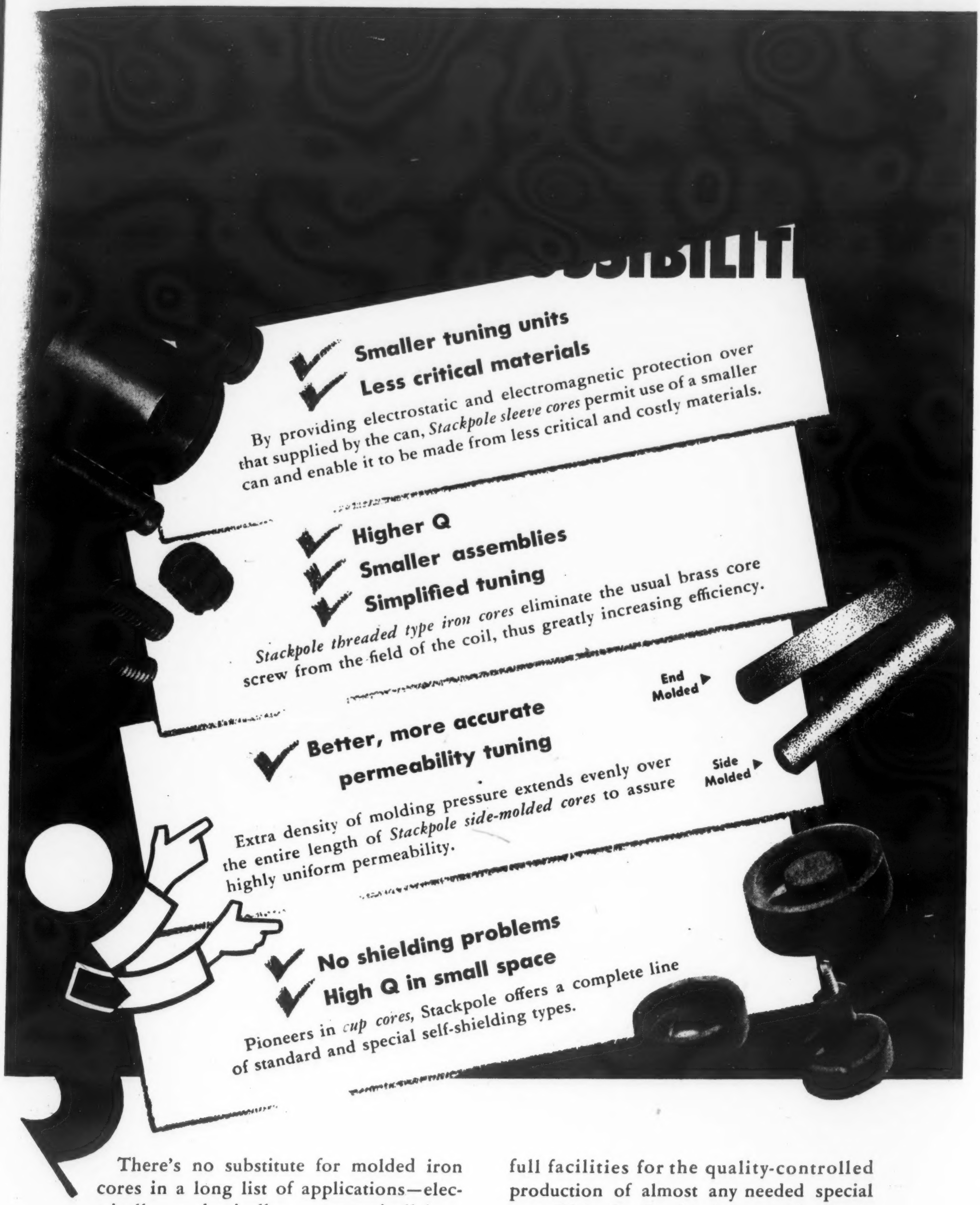
As customary, the members and guests met at the Chamber of Commerce Building for the dinner-meeting.

For the information of guests present, Chapter President Marshall James opened the December 12th meeting by reading the preamble of the AFCA constitution and explaining the purposes of the association. He pointed out the advantages of membership, stressing particularly the monthly news letter and magazine SIGNAL.

John F. Rozanski of ACS, chairman of the nominating committee, submitted the following slate of nominees for chapter office for 1952: for president—Frank D. Keyser; vice-presidents—Warren J. Taylor and Phil Duryee; secretary—Merrill R. Stiles; treasurer—Joe Gregory. Additional nominations were welcomed and ballots will be mailed to the entire membership prior to the annual meeting in January. Two films were shown at the conclusion of the business session: one entitled "Rome Story" showed scenes of buildings dating from the dark ages to the present time; the second was filmed at

San Francisco Chapter members dining at officers' mess, Presidio of San Francisco, preceding a tour of Sixth Army signal installations.





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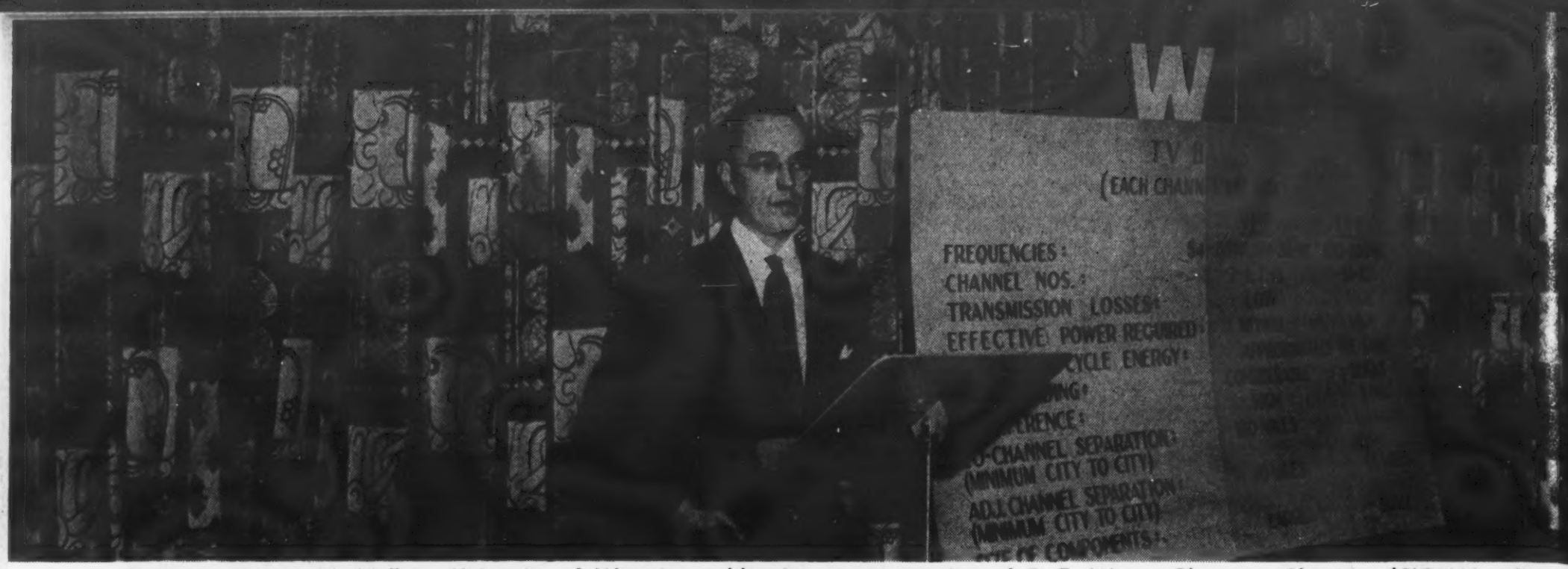


Professor Warren M. Mallory, University of Wyoming, addressing recent meeting of F. E. Warren-Cheyenne Chapter. (SIGNAL editors found the background drapes so interesting they couldn't help but include all of it shown in the photo.)

CHAPTER NEWS

a copper mine and covered the operations from the mine through the final processing of the copper ore.

South Carolina

Howard Van Zandt's "Adventures in Telecommunications in Japan" lecture was presented at the November 12th meeting of the South Carolina Chapter. This was Mr. Van Zandt's first appearance on his tour of AFCA chapters and the appreciative interest displayed by the South Carolina audience was duplicated by the other AFCA groups he visited.

The meeting was held at the U. S. Navy Mine Craft Base, Charleston, and was preceded by a dinner at the officers' club. Chapter President John L. H. Young opened the meeting with a resume of plans for future chapter activities. Ralph Grist, AFCA Southeastern area representative, discussed the mission of the association and stressed the importance of having regular scheduled chapter meetings.

Committee chairmen for the coming year were appointed as follows: nominating—J. M. McAlister; membership—O. C. Tigner; program—Capt. H. H. McCarley.

F. E. Warren-Cheyenne

The chapter's first regular election was held on October 29th with Lt. Col. Norman Fertig of F. E. Warren Air Force Base chosen as president. Other officers elected were: 1st vice-president—William Evans of Mountain States Telephone Co.; 2nd vice-president—Edward Hallen, Chy-y Radio Club; secretary—Thomas V. Rhoads, F. E. Warren AFB; treasurer—Capt. Owen E. Jacoby, F. E. Warren AFB. Following the election the temporary officers retired and the meeting was turned over to the new slate.

The proposed chapter constitution was read to the members for the purpose of correction and addition, with the corrected constitution to be offered for approval at the next meeting.

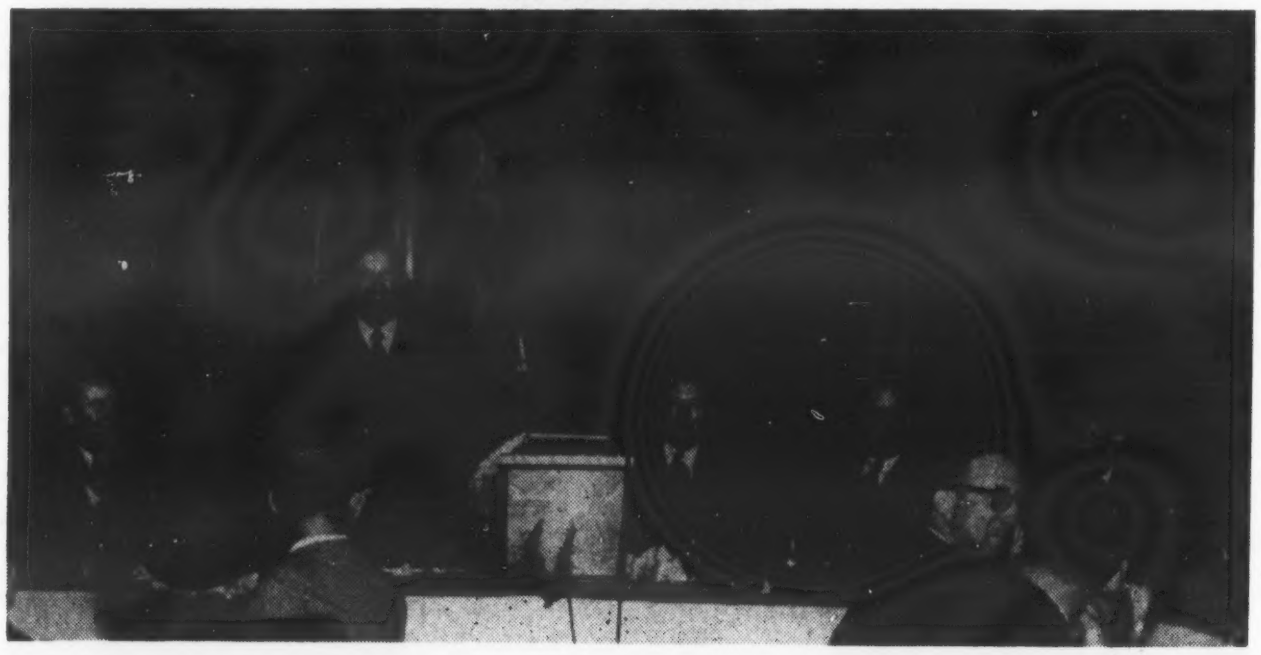
Committee chairmen were appointed as follows: membership—M/Sgt. Marvin C. Pearman; meetings—Roderick E. Lacy; publicity—George Humphreys. In addition, it was voted to consider Mr. Lacy, former temporary president, as past president of the chapter and as such a member of the executive committee. Much credit goes to Mr. Lacy and to former temporary secretary Thaddeus Byars for their excellent work in guiding the chapter in its organizational stages.

Professor Warren M. Mallory of the University of Wyoming electrical engineering staff, and one of the foremost consulting engineers in the Rocky Mountain region, gave a most interesting talk on the future of television in Wyoming at the chapter's December 11th meeting.

Special guests of the chapter were Professors V. O. Long and R. O. Trueblood of the University of Wyoming electrical engineering department; Mr. Frank M. Thomas, Wyoming State Senator, and Mr. Dick Redburn, secretary to Governor Barrett of Wyoming.

The meeting was held in the East Wyoming Room of the Plains Hotel in Cheyenne, with 49 members and guests from the local communications industry and the Air Force installation present. The amended proposed constitution was read and adopted; it was agreed to postpone work on the by-laws until the next meeting. Sgt. John Stanneff was appointed to look into the possibilities of raising some funds in order to send a chapter delegate to the national AFCA convention in Philadelphia in April.

Washington Chapter hears address by Capt. W. B. Goulett, USN, director, Naval Communications. L to R: Rear Adm. C. C. Hartman; Capt. Goulett; Pres. Percy Black; Rear Adm. John R. Redman, director, communications-electronics, JCS; and Pres Shivers, program committee chairman.



Washington

Recent Washington Chapter meetings have been occurring right after SIGNAL's publication dates, so that the latest meeting, in February, came just too late for the report on it to make this issue. There was no January meeting, making the December meeting, which took place just after publication of the last issue, the latest able to be reported on.

Navy communications featured the December meeting, held at the usual National Press Club auditorium, with Captain Wilfred B. Goulett, USN, as the speaker. Others in the Navy group at the speakers' table included Rear Adm. John R. Redman, director, communications-electronics, Joint Chiefs of Staff; Rear Adm. C. C. Hartman, Jr., deputy CNO; Capt. W. H. Beltz, assistant chief of electronics, BuShips; and also the chief of Coast Guard communications, Capt. E. K. Rhodes.

Rear Adm. Joseph R. Redman, USN, ret., vice president of Western Union, was scheduled as the principal speaker for the February meeting.

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SIGNAL NEWS

Communications-Electronics-Photography

Communications Industry Hit By New Cut In Metals Allocations

The communications industry suffered another slash in the amounts of controlled materials allocated to it by the Defense Production Administration, it was revealed in January in the announcement of the government's allotment program for the second quarter of 1952. The DPA figures indicated another deep cut in what can be accomplished by the industry during the period from April to June. Copper and aluminum allotments will be lower than was received during the first three month period.

The amounts fall short of what is needed to just keep even with new demands for service during the quarter, so that with increasing demands for service and upgrading of present service, the already existing huge backlog of requests will continue to mount.

Reductions in the amounts of allocations had been anticipated as mobilization officials in recent weeks kept reminding industry that military demands were on the increase. Any slight hope that the communications industry and some others would be granted metals at levels closer to what they needed were completely dashed when DPA Administrator Manly Fleischmann in a recent appearance before the Joint Committee on Defense Production told the legislators that deep cuts in allocations would have to be made. "When you take out the military use of copper, you have only about 50% of the pre-Korea use of copper that can be permitted," said Mr. Fleischmann.

The importance of this country's communications system as a defense weapon, and the endangering of that network by the cuts in metals allocations was pointed up recently in a *New York Times* review of the situation by Thomas P. Swift. The *Times* writer stressed that America's system of communications of all types is the largest and most dependable on earth and is still growing at an unbelievable pace, but that there is trouble ahead if the present supply of copper and aluminum is kept at its present thin level or is further decreased.

The AT&T in a February 5 release stated that its allotment for copper had been cut 10% for the second quarter, in addition to the 25% cut for the first quarter. When the first quarter cutback was made the Bell Companies said that more than a million people who will want telephone service this year will not get it as result of the lesser metals allocations.

Ammon Named Director, Naval Communications O'Connell Is Deputy Chief Signal Officer

Rear Admiral William B. Ammon, USN, has been appointed Director, Naval Communications, succeeding Capt. W. B. Goulett, USN, who has headed the communications division since September 1, 1951, when the former director, Rear Admiral John R. Redman, USN, was named Director, Communications-Electronics for the Joint Chiefs of Staff. The date of Adm. Ammon's taking over the Naval communications directorship had not been announced as SIGNAL went to press, but it was assumed that it would be March.

The appointment of Brig. Gen. James D. O'Connell as Deputy Chief Signal Officer was made December 1, just as SIGNAL's last issue was being published, so that this announcement is perforce somewhat belated.

General O'Connell had been serving since last August in the special assignment group, boards and committees, OCSigO. In his new appointment he replaced Maj. Gen. Kirke B. Lawton who has taken over command of Fort Monmouth, N. J.

Adm. Ammon has had a comprehensive and lengthy career in Naval communications and is highly regarded for his administrative capacities and planning. He served from November 8, 1948, as assistant director, Naval communications, until February 1951 when he was given a sea duty command in the Pacific Fleet. It had been expected that the sea duty assignment was a preliminary to his appointment to the directorship of communications.

A 1923 graduate of the Naval Academy, Adm. Ammon has served with distinction in a number of varied and important communications assignments during his Navy career, as well as in sea duty assignments and command on destroyers, cruisers, and battleships. He has had tours of duty as fleet communications officer in the Navy Department and with the commander-in-chief of the Pacific Fleet, as well as a two-year World War II assignment as communications plans officer in the Naval communications division.

Following his completion of a post graduate course in electronics at the Naval Academy and Harvard University, he served as communications officer of the battleship *Oklahoma*, a battleship division, and the Navy scouting force. He was a member of the first class to graduate from the National War College after V-J Day.

Gen. O'Connell, the new Deputy Chief Signal Officer, has also had a long and broad experience in military communications. A native of Chicago and a 1922 graduate of the U. S. Military Academy, he served as chief of the general development branch, OC SigO, from July 1942 to January 1943. He then was executive officer of the signal supply service until July 1943, when he was designated officer-in-charge of the technical staff of the supply service. He went overseas to the European theater a year later, and was assigned as chief of the requirements branch of the signal section, 12th Army Group, serving in England, France, and Germany. In June 1945 he returned to the United States and was named director of engineering of the Signal Corps Engineering Laboratories at Fort Monmouth. In 1946, he was named commanding officer of the Laboratories.

His next service was in the Far East from May 1947 to November 1948 as signal officer of the Eighth Army in Japan. Upon his return to the States he became deputy president of the Signal Corps Board at Fort Monmouth. He served as signal officer of the Second Army from November 1950 until going to the special assignment group at OC SigO last August.

IRE Meeting Marks 40th Year

"Forty years Set The Pace" is the keynote of the 1952 national meeting of the Institute of Radio Engineers being held March 3-6 in New York City, as the organization commemorates its 40th anniversary.

The opening meeting of the convention will be the annual meeting of the Institute which, in honor of the anniversary, will feature an interesting presentation of forty years of IRE by Alfred N. Goldsmith and John V. L. Hogan, two of the co-founders. This meeting will be held March 3 in the Jade Room of the Waldorf-Astoria Hotel. The radio engineering show, expanded to include four floors of exhibits, will again occupy the Grand Central Palace. Sessions of the extensive technical program will be held in both locations and the nearby Belmont Plaza.

THIS DEPARTMENT'S PRINCIPAL SOURCE

Telecommunications Reports

Roland C. Davies, Editor
National Press Building
Washington, D. C.

Another Honor For Goddard

During a three-day meet in Washington, D. C., January 9-11, the American Society of Photogrammetry voted an honorary membership to Colonel George W. Goddard, director of research and chief of the Air Forces Reconnaissance Laboratory, Wright AFB, Dayton, O.

The membership was conferred upon Colonel Goddard for his "distinguished service to aerial photography." His achievements in this field won him the Photographic Society of America's 1951 Progress Medal last October at the Society's convention in Detroit.

Virtually all of Colonel Goddard's 34-year military career has been devoted to aerial photography. He pioneered the development of rapid processing of photo film and prints during flight, wire transmission of military air photographs, and simplified developing and printing equipment. He is credited with the invention of special shutter and flash synchronization equipment for aerial cameras used in making the world's first night aerial photographs, equipment which is now standard in the Air Force.

Scrap Need Serious

Defense Mobilizer Charles E. Wilson and DPA-NPA Administrator Manly Fleischmann have recently been, and are continuing to stress the critical metal scrap shortages in the U. S. defense build-up. "We simply cannot meet the military demands," warns Mr. Wilson, "and maintain even a reasonable civilian production without vast quantities of iron, steel, copper, brass, bronze, aluminum, zinc, and other essential metals. This production calls for enormous amounts of scrap in all these fields. Those who make and use machinery have scrap. *Get it in!*"

Col. Gordon Stephenson

Colonel Gordon Stephenson, one of the most extraordinary personalities in World War II Signal Corps operations, was killed in an automobile accident January 17. He was buried from the Euclid Avenue Methodist Church, Oak Park, Ill.

In charge of the surplus property division of the Signal Corps at the time of his separation from service in 1946, Col. Stephenson had been commanding officer of the Lexington Signal Depot (Kentucky) the year before, after having earlier been director of supply of that depot. From March to June 1942 he had been assistant director of supply services and from June 1942 to May 1943 was in charge of the distribution section, Office of the Chief Signal Officer. He was coordinating officer and director of the storage division from May 1943 to March 1944 at the Philadelphia Signal Depot, just prior to going to Lexington.

At the time of going into government service, Col. Stephenson was vice president in charge of operations of Sears Roebuck & Co. In 1941, when the U.S. was preparing against the threat of war, but had not yet been attacked, the executive vice president and executive committee chairman of Sears, Donald Nelson, who later resigned from the company to head the War Production Board, was on leave from Sears serving the government in Washington in a variety of assignments heading up purchasing, procurement, and priorities and allocations. During one of these pre-war assignments he found in one agency a veritable warehouse full of unprocessed paperwork which in the mounting mobilization activity the agency had been unable to cope with. To untie that snarl, Nelson called in three men from Sears, one of which was Stephenson. In a space of time so short as to be amazing to everyone concerned, the mass of confusion was straightened out and a system set up to eliminate further clutter. Stephenson was regarded as principally responsible for the feat, which drew to him the attention of many leaders in the defense buildup. One of these was William H. Harrison, IT&T president, who had come in in the rank of major general to head Signal Corps procurement and distribution. Gen. Harrison brought Stephenson into the Signal Corps to assist in the rapidly growing supply system, and what had been a temporary government service for Stephenson became a full wartime job.

Some observers give Stephenson the major credit for the building up of the Signal Corps supply system into the splendidly efficient operation it is today. His experience with procurement and distribution and warehousing on the giant Sears scale had developed in him a vast ability for shaping a big supply system, and it has been said that he left "a master's touch" on the depots where he had been assigned, and on the entire Corps' supply and distribution system. It is also asserted that he gave his best to the Signal Corps, and was ever intensely concerned with the Corps' reputation. Dynamic and brimming with ideas, he had too a gift for picturesque language, which, his admirers aver with some awe, was not the least of his talents.

His exceptionally able work, and the universal high regard in which he was held, are summed up in a tribute from the Chief Signal Officer, Maj. Gen. George I. Back, who stated, "The Signal Corps has suffered a great loss with the passing of Col. Stephenson. His contributions to the success of Signal Corps supply operations during World War II were major in character. He will be missed by his many admirers in the Corps."

Aluminum Phone Wire Attempted

Aluminum telephone wire may come into common use if present Bell System experiments are successful, and if AT&T can obtain a sufficient allotment of aluminum to enable its engineers to carry on the experiments. Its attempt to develop a satisfactory aluminum wire is part of the Bell System's search for substitutes to offset shortages of raw materials previously used in telephone equipment.

Ability to produce aluminum wire cable in quantities large enough to make a substantial contribution to the demand for telephone service will depend on future availability of increased quantities of aluminum as well as steel, polythylene, and other materials used in its manufacture.

Naval Research Vacancies

Scientists, engineers, and mathematicians are needed by the Navy to fill Civil Service vacancies in naval activities throughout the U. S. and in some overseas stations, at salaries ranging from $4,205 to $10,800. The civilian personnel division of the Office of Naval Research has released a bulletin listing several hundred vacancies, qualifications and grade levels, for a large number of fields including electronics.

Airborne Electronics Conference

The National Conference on Airborne Electronics, begun in 1949 and held annually since at Dayton, Ohio, takes place this year May 12-14. The scope of the scheduled conference is considerably enlarged over that of previous conferences because of the ever increasing importance of electronics in aviation, and also because of a greatly enhanced coverage this year of airborne electronics for commercial aviation needs in addition to the usual thorough coverage of electronics in military aviation.

The conference is held under the sponsorship of the IRE's Dayton Section, and Professional Group on Airborne Electronics.

Roemer Heads Federal Tel & Radio

Henry C. Roemer, executive vice president of Federal Telephone and Radio Corporation, Clifton, N. J., since September 1950, has been elected president of that manufacturing associate of the International Telephone and Telegraph Corporation, it was announced recently. Mr. Roemer, who directed Federal's activites during World War II, assumes the presidency of the company during new national crises calling for his wide experience in handling problems arising out of the defense effort.

Henry C. Roemer

Mr. Roemer has been prominent in the development of Federal since 1940. It was under his guidance as executive vice president that the company's facilities were expanded to help meet the nation's requirements for communication and other equipment during the years of the last war. The end of that conflict found Federal with 58 locations in and around Newark devoted to manufacture for the armed forces.

At the same time, Mr. Roemer was active in the planning and construction of Federal's plant at Clifton and the Federal Telecommunication Laboratories, Inc., Nutley. With Col. Sosthenes Behn, IT&T board chairman, he broke ground for the plant in February of 1943, and in the following year he turned the first spade of earth for the Laboratories. The latter, with its 300 foot mircowave tower, "a laboratory in the sky," and Federal's plant with its million square foot production area, continue to serve the nation's defense and contribute to the prosperity of northern New Jersey.

Marine Photog On Defense TV

The hazards of combat photography was a feature discussion of a recent "Pentagon-Washington" television show, in which Marine photographer Sgt. Frank C. Kerr was interviewed. A photo by Sgt. Kerr of the Marine withdrawal from Hungnam and the Chosin Reservoir was a prize-winner in an earlier Department of Defense TV display of combat photographs from Korea. The interview with Kerr was conducted by William Adams, feature photo editor for the Department of Defense.

The second Marine to land in Korea, Sgt. Kerr has provided photographic coverage for the Marines in most of their major battles. He covered three battles in the Pusan area, followed through to Wolemi-do and Inchon, the area around Wonsum and Chosen Reservoir, and the trek to Hungnam for the evacuation.

The combat photographer is generally close to the front lines, Kerr told the TV audience, and even behind the enemy lines at times, if out with a patrol. In northern Korea, he said, the intense cold had been of course an additional severe handicap to the photographer.

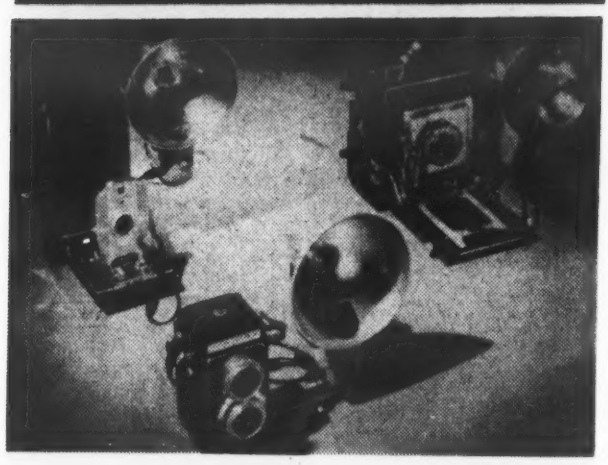
A former writer in the Marine Corps, Sgt. Kerr changed over to photography three years ago.

SCEL Members on ASA Committees

From Photographic Branch

Six members of the Signal Corps Engineering Laboratories photographic branch have been named Department of Army representatives or alternates on new committees of the American Standards Association.

Kodak Ektalux Photoflash—lower Photo, adapted to various cameras. (See page 65)



Named to the photo sensitometry committee are Steven Levinos, chief of the chemical and methods section, and Irving Bauman. Member of the films, plates, and paper committee is Frank Smith, chief of the analysis and test section.

Other committees and their Signal Corps members are: Photo apparatus, Bernard Maslow and Joseph Burke, chief and assistant chief of the still equipment section; Photo processing, Alan Rahm, assistant chief of the chemical and methods section, and Steven Levinos.

The American Standards Association is responsible for setting up standards for industrial materials and equipments, making it easier to interchange parts and to evaluate qualities of various products.

Prize-Winning Photographer Commended By Sec. Pace

A Fallen Comrade—Sgt. Chang's prize-winning picture showing a grief-stricken American Infantryman, whose buddy has been killed in action, being comforted by another soldier, while alongside a corpsman methodically fills out casualty tags. Haktong-Ni area, Korea, August 1950.

Sgt. Al Chang, Signal Corps photoglapher who won first prize in a Department of Defense contest of Korean combat photography, has received a letter of commendation from Secretary of the Army Frank Pace, Jr., for his accomplishment.

The letter states, "After seeing your superb photograph of "A Fallen Comrade," I can well understand why you were awarded first place in the Korean combat photography exhibit. Please accept my warm congratulations and those of the Department of the Army."

Secretary Pace also sent a letter to the Chief Signal Officer, Maj. Gen. George I. Back, stating in part, "I am very proud that the Army came away with top honors and I want to commend you for your part in making this possible. Without the training our combat photographers receive before they embark overseas, it is doubtful if they could produce such splendid work in Korea."

To Brig. Gen. Elton F. Hammond, signal officer of the Far East Command, Mr. Pace wrote, in part, "I am fully aware of the splendid job geing performed by all Army photographers in Korea under trying and dangerous conditions. To these men who daily risk their lives alongside of our combat soldiers, I send my warm congratulations. I desire especially to commend you for the part you have played in insuring such splendil coverage by our Army photographers in Korea."

Ansco Staff Promotions

Harold C. Harsh has been named production manager of Ansco, a division of General Aniline & Film Corporation, putting him in charge of film, paper, and chemical plants, plus all direct auxiliary functions to these plants. Also advanced by Ansco were Maurice G. Anderson, who succeeds Harsh as manager of the quality control department, and Rocco L. Fiaschetti who succeeds Anderson as manager of film quality control.

Mr. Harsh, in his new position, succeeds Harold Pletcher, recently resigned. Holder of an A.B. degree from Ohio State U., and an M.S. in physical chemistry from M.I.T., Harsh became

(*Continued on page 66, Col. 1*)

New Synchronized Camera System

A new high precision system for synchronized motion picture camera operation, providing five times closer time synchronization than heretofore possible, was recently announced by J. A. Maurer, Inc., Long Island City, N. Y. The system, developed for the Wollensak Optical Co., Rochester, N. Y., and manufactured by Maurer, achieves a long-sought goal in scientific photography—dependable, consistent, and accurate operation of a series of motion picture cameras taking their pictures at the same time to close tolerance.

Among the scientific and engineering applications for which this system will be utilized are data recording, flight testing, missile tracking, ordnance evaluation, and most applications where two or more sources of information must be recorded at essentially the same time.

There is said to be no practical limit to the number of cameras that may be synchronized by this method. An interesting use lies in three-dimensional studies where two geometrically oriented cameras are required for simultaneous recording. The system also has application in professional and television motion picture production where extremely close time synchronization of a number of cameras, projectors, or sound recording apparatus is required.

Kodak Ektalux Photoflash System

The Eastman Kodak Company has announced wide acceptance and praise for its new Ektalux System, a professional-level photoflash system introduced late last year. The new flash system features battery-capacitor operation and includes accessories which enable use of the system with a wide range of professional, press, and advanced amateur camera equipment. The flash holder, departing from traditional styling, is said to be the first high-energy, battery-capacitor unit scientifically designed for holding.

The basic advantages of battery-capacitor operation over conventional battery flash systems are pointed out by the Eastman company as numerous. Conventional battery systems are characterized by low power, inability to handle a number of lamps at one time in reliable synchronism, and increasingly unreliable performance as the battery declines with use. Cold weather, contact resistance, and minor variations in lamp resistance, all materially affect performance. Capacitor triggering overcomes these limitations by substituting a quick surge of power, uniform both in amplitude and release time for the battery's slow and varying power flow.

The battery-capacitor system, for a given bulk, delivers more synchronization, more lamp-handling capacity, more flexibility in set-up, since longer extensions can be used. Its performance is not so seriously affected by temperature, or by battery decline. It is thrifty because of its reliability of performance and long battery life. A battery lasts one to two years, with full performance as long as it retains even a small charge, is good for thousands of flash exposures.

The basic unit of the new system, the Kodak Ektalux Flasholder, is of a saw grip design externally, with a parabolic reflector nesting in front. The design provides new compactness, superior grip, and extreme sturdiness. Its total weight with batteries is only 31 ounces. There are inputs for flash shutter cord and solenoid cord, and outputs for two extension lines and a remote control cord. Three mounting brackets are available, one for standard amateur cameras, one for Polaroid cameras, and one for press cameras. The press bracket is a quick-on, quick-off type, with a special latch which prevents accidental removal.

The battery-capacitor system uses one or two 22½-volt batteries providing 22½ volts or 45 volts to charge a high-capacity electrolytic condenser, and the charge stored in the capacitor is then released to ignite the primers of one or more lamps. A limiting resistor prevents the capacitor charge from kicking back into the battery, and no appreciable current is drawn from the battery during the lamp discharge. The capacitor automatically recharges while the camera is being readied for the next exposure.

(*Continued from page* 64, *col.* 3)

a production supervisor in Ansco's photographic paper plant after graduating from M.I.T. in 1934, and was later placed in charge of development work which led to the present Ansco color products. He is a Fellow of the Society of Motion Picture and Television Engineers, a Fellow of the Photographic Society of America, a member of the American Society for Quality Control, the American Chemical Society, and the Armed Forces Communications Association.

Anderson joined Ansco's paper testing department in 1935 after obtaining a B.A. degree at Oberlin College, and Fiaschetti, a Phi Beta Kappa with a B.A. from Hobart College, 1940, served as an assistant in Ansco's chemistry department during his undergraduate days.

New Kodak Publications

Among recent new Eastman Kodak publications are a data book describing professional photographic papers, another data book on chemical preparations, and a volume on "Lenses in Photography." Also, in response to numerous requests, the four sections of the Kodak Color Handbook have been made available as individual color data books.

The book on lenses has been written to cover those aspects of photographic optics of interest to the serious photographer, amateur or professional, who wants to know not only why their lenses work as they do, but also how to get the most out of them. With as nontechnical approach as the subject permits, the book is aimed at enabling the user to understand the working of lenses, cameras, enlargers, and projectors, so that the photographer can choose intelligently from among the available apparatus, and make the best use of his own equipment.

The new booklet on photographic papers discusses the often overlooked details than can mean the difference between a merely acceptable print and one of really fine quality. The booklet on chemical preparations treats with the advantages of using prepared chemicals instead of compounding your own formulas, and gives considerable information on the preparation of solutions. Time-temperature charts, keeping-property charts, and instructions on the preparation, use, and storage of chemical preparations are also provided.

The four sections of the color handbook, now available separately, are "Color As Seen and Photographed," a general discussion of color photography, providing the background information on color processes and color vision necessary to the photographer beginning to get serious about color; "Color Photography Outdoors," which covers the ABC's of picture taking outdoors in color, including sections devoted to flash and scenic photography, illustrative photography, and architectural photography; "Color Photography in the Studio," stressing basic lighting techniques that photographers can easily adapt to a variety of subject matter; and "Kodak Color Films," a roundup of information on handling, processing, color balance, use of filters, and other important subjects related to color films.

Note: Corrections

"Electron Tube Reliability"

In the November-December 1951 issue of SIGNAL there was published an article by E. Finley Carter of Sylvania Electric Products, Inc., titled "Electron Tube Reliability." The article as published contained two errors, both on page 26. The captions for Figures 4 and 5 were transposed, and the paragraph second from the end of column two should have begun as follows: "In the development of the subminiature series of tubes. . . ."

Ansco Review Now Available

"Ansco Abstracts," a complete monthly review of photographic literature, is now being published for sale by subscription by Ansco's research department library. Originally intended solely for use by the company's research department, the review contains up-to-date information on photographic technical developments, literature references, new literature, and new patents.

Produced in mimeographed form to permit inclusion of the latest information, often as close as a few days after it becomes available, Ansco Abstracts covers the various aspects of photography, including physics and chemistry, graphic arts, purely photographic items, applications of photographic principles in television, radiography, medicine, etc.

For additional information on subscriptions write direct to the Library of the Research Department, Ansco, Binghamton, N. Y.

Air Force in on Eclipse Study

In SIGNAL's last issue the projected trip of Naval Research Laboratory scientists to Khartoum, in the Anglo-Egyptian Sudan, to make observations of a total solar eclipse, was described. It has since been learned that the Air Force will also take part in the observations, but at sites from Libreville, French Equatorial Africa, to Dhahran, Saudi Arabia.

On February 25, the moon's eclipse of the sun will be observable to the expeditions across an arc extending from the Gulf of Guinea to the Persian Gulf. At six sites across this arc Aeronautical Chart and Information Service observers will take readings of the exact instant of totality through the use of a photo-electric cell which will receive the varying light intensities during the eclipse. These intensities will be automatically recorded against time signals. The time of lowest intensity at each site will be the moment of total eclipse. Having obtained that time and knowing the speeds at which sun and moon are traveling with relation to the earth, the distances between the sites may be computed, possibly within a margin of error of only 200 feet.

The expedition, conducted by the ACIS, an Air Materiel Command agency, will include participation by the Geophysics Research Division of the Air Force Cambridge Research Center. At this center scientists and technicians study physical phenomena on the earth and in the atmosphere and their effect on Air Force operations. The center will also sponsor participation of groups of scientists of the University of Colorado and University of Denver.

The Colorado group will make studies during the total eclipse of the sky brightness extending to about 30° from the sun. Photographs will be taken with a powerful Schmidt-type camera from a plane flying at very high altitudes. The camera will include optics suitable for the detection of polarized

(*Continued on page* 68, *col.* 1)

Department of Errors and Apologies

In the November-December issue of SIGNAL we reported, with some distortion, on an address before the AFCA Washington Chapter, November 7, by Major General Douglas Ashton Lofft Wade, C.B., O.B.E., M.C., telecommunications attache of the British Embassy in Washington. In our version we had General Wade saying that telegraph cable had been laid between Dover and Calais 163 years ago! In a letter to us reproduced below, General Wade points out the true dates and other facts.

The letter, it will be noted, also points up the first international television broadcast, August 27, 1951. This event took place when centenary celebrations commemorating the laying of the first Dover-Calais telegraph cable were televised from Calais over the BBC television service. The history making event escaped our attention, probably because at approximately the same period we were being impressed with some U. S. firsts in television, beginning with the first coast-to-coast viewing. For some time thereafter there were almost daily coast-to-coast program firsts, and occasionally one takes place even now. But the first international television broadcast took place between France and Great Britain on August 27, 1951. Record *that* in your almanac, if you're attempting to keep informed on communications history.

The occasion of Gen. Wade's address at the AFCA's Washington Chapter meeting was the presentation to him of an honorary membership in the AFCA. His letter to us follows:

Dear Sir:

I see that in the account of my address to the Washington Chapter of AFCA on November 7th (page 64 of SIGNAL for November-December 1951) it is stated that I "noted that this year was a most important anniversary in communications, marking the laying of the first cable between Dover and Calais by the British Royal Navy 163 years ago. . . ."

In referring to the two anniversaries in the telecommunications field which mark the year 1951, what I actually said was:

"It was but a few months ago that we across the Atlantic celebrated *the centenary* of the first electric submarine cable laid between Dover and Calais, and, in a few days we shall, on both sides of the Atlantic, be celebrating the 50th anniversary of Marconi's bridging of the ocean by wireless telegraphy.

"From these two historic events have sprung the vast networks of telecommunications which span the continents and oceans today and in the building of which your country and mine have taken the leading parts.

"I need hardly remind you that in building up these networks the armed forces have played an all-important role. It was the Royal Navy, who in 1898, first put Marconi's invention to practical use in His Majesty's ships. It was the British army who first applied mobile wireless telegraph stations to field use in South Africa in 1900, and it was to meet the defense needs of Great Britain that radar was secretly developed prior to World War II and thereby the R.A.F. was enabled to defeat the Luftwaffe in the Battle of Britain in 1940."

The first submarine telegraph cable to be brought into regular use was laid down between Dover and Calais in 1851, and was the outcome of private enterprise. The centenary was celebrated by a joint Anglo-French ceremony held at Calais on 27th August, 1951. The proceedings were broadcast "live" in the B.B.C.'s television service, and were of interest as being the first international broadcast in the history of television.

I hope you will forgive me for bringing the above to your notice. I do so solely in the interests of historical accuracy.

I would like to say how much I appreciate reading your excellent journal.

Sincerely yours,

D. A. L. Wade

(*Continued from page 66, col. 3*)

light. It is expected that the photographs may reveal the presence of the zodiacal glow within the vicinity of the eclipsed sun. This glow has been observed after sunset and before dawn beyond 38° from the sun, but never within that limit because twilight prevents its detection. Theories of the origin of the glow have attributed it to scattering or reflection from either inter-planetary particles revolving around the sun or outlying extensions of the earth's own atmosphere.

The University of Denver experiment is to determine the rate of disappearance of the sky light in various regions of the spectrum before total eclipse and the rate of their reappearance after totality. It is the opinion of the University of Denver experimenters that there will be a different time at which the various colors of light will vanish when the sun's light is extinguished by the disk of the moon. The reason for this expectation is that the daylight luminescence of the upper sky will continue to give off the energy after the source of energy for this phenomenon, namely the sun's light, has been withdrawn. The eclipse of the sun provides a unique condition whereby the light from the sun is very rapidly cut off.

All of these experiments being undertaken will aid in establishing a more accurate knowledge of some of those properties of the upper atmosphere which have been designated as important, such as composition, temperature, optical and electrical properties, and the processes which occur between atmospheric compounds.

The scientific knowledge derived will ultimately contribute to the design, operation, and control of aircraft, to increased efficiency of radio transmission and reception and to improved understanding of the atmospheric heat budget which applies to extended period weather forecasting problems.

Vitzthum SigCorps Inspector General

Colonel Harry L. Vitzthum, former chief of the operations review division in the Office of the Chief Signal Officer, has been appointed inspector general of the Signal Corps. Prior to heading the operations review division, Col. Vitzthum had been assistant chief of the procurement and distribution division of the Signal Corps.

It was reported, at the same time, that the Air Force may transfer Brig. Gen. Gilbert Hayden to the office of the inspector general. General Hayden has been serving as deputy commanding general of the Wright Air Development Center at the Wright-Patterson AFB in Dayton, Ohio.

Assigned also to the office of the inspector general of the Signal Corps, which was established Jan. 12, was Lt. Col. Allen T. Stanwix-Hay, who had been assistant chief of the operations review division.

Unique Device Aids Naval Reservists In Radio Code Training

The "Code-O-Scope" in use at the Naval Reserve Training Center, Everett, Washington.

Teaching radio code at the Naval Reserve Training Center, Everett, Washington, is made easier through use of the "Code-O-Scope," designed at the center. The unique training device contains a radio telegraph key, an audio oscillator, signal lights representing shipboard blinkers, and a representative telegraphic typewriter keyboard.

In operating the device for radio code, the instructor sends messages which are received by the students either from the loudspeaker on top, or through headphones. If a class is less experienced, and needs typewriting practice at the same time, the instructor lights up the character he is sending, thus assisting the students in touch typing while receiving radio code.

Gen. Scott, Royal Signals Chief, Heads Weapons and Development

On the termination of his three year tenure as Director of Signals (British War Office) Major General W. A. Scott, C.B., C.B.E., was recently appointed Director of Weapons and Developments. It is regarded as significant that a signals officer should have received this appointment, in view of the nature of present day weapons development.

General Scott was a recent visitor to the U. S. where he toured communications-electronics centers. He was host to Maj. Gen. Spencer B. Akin, when the former Chief Signal Officer visited Great Britain.

The occasion of Gen. Scott's new assignment brought out expressions of great esteem for his accomplishments as Royal Signals director. He is regarded as having strengthened the Corps and its prestige in a period of considerable expansion.

Armed Forces Industrial College Correspondence Study Course Open

Qualified applicants for the correspondents study course presented by the Industrial College of the Armed Forces can now be accepted for enrollment without undue delay. During the planned gradual buildup to authorized capacity, enrollment of many applications was necessarily delayed. Now the normal operation of the course is creating both military and civilian vacancies.

The correspondence study course presents the background material and generally accepted basic principles necessary to a sound analysis of the problems found in the mobilization of the national economy. The course, based on the regular 10 months' resident course conducted by the Industrial College, is available to qualified regular and reserve officers, National Guard officers, and selected civilian leaders in the fields of industry, education, labor, science, and civic life.

Requests, both military and civilian, for prospectus and application blanks may be made directly to the Commandant, Industrial College of the Armed Forces, Fort Lesley J. McNair, Washington, D. C., attention Correspondence Study Branch.

SigCorps Reclamation Pays Off

In line with its intensive economy campaign the Signal Corps in recent years has rebuilt and put to use a total of nearly $80 million worth of communications equipment which had been abandoned on Pacific Islands near or at the close of World War II. (See "Signal Economy in the Battlefield," page 21, this issue, for an account of equipment reclamation in the Korean theater.)

At the time of the communist invasion of South Korea, nearly 70,000 tons of signal equipment had been brought to Japan, but much of it had deteri-

...ted so badly that it was not usable ...thout extensive repairs. Stocks in...uded about 50,000 different items of ...lephone, teletype, radio, radar, and ...hed complex electronic devices. In ...dition there were more than 30,000 ...les of field wire and more than 2,000 ...lephone switchboards.

Contracts were made with 25 Japa...se factories to recondition the equip...ent, for inspection showed that vir...ally all of it had suffered from rust, ...rrosion, or other damage. Fungus had ...iled many open spaces in the equip...ent. Although most of the work which ...ad to be done was strange to the Japa...ese, they learned quickly under the ...upervision and guidance of trained Signal Corps technicians.

One Japanese company alone, it was reported, had repaired 24,000 radio sets and 20,000 telephones before the beginning of the Korean conflict. If procured in the United States, the Signal Corps said, the equipment would have cost $10 million. Cost of making it serviceable was less than 10% of that figure.

NAVY NOTES

Panel Makes Electronic Brain

A general purpose master control panel built at the Naval Ordnance Laboratory converts a regular IBM. Card-programmed calculator into the equivalent of a room-sized electronic brain . The 24 x 28 inch panel makes possible such operations as automatic generation of elementary trigonometric, hyperbolic and exponental functions and their inverses to seven decimal points in one second, and the printing, storing, punching or retention within the computer of answers.

Underwater TV

Underwater television cameras developed by Navy's BuShips will safeguard human life and facilitate salvage and other underwater operations, as well as save valuable time. In depths of over 200 feet, a diver spends greater part of a dive in the descent and ascent, with added drawback that walking on the bottom may stir up silt and block his own view, while a TV camera may be quickly lowered and raised; with suspended lights, personnel on board ship may make lengthy observations of the ocean bottom, even filming the televised picture for future reference if necessary. Salvage operations in the future may be completely planned before a diver ever goes down to the actual work.

Magnetic Ship Model Lab

A magnetic ship models laboratory is now nearing completion at the Naval Ordnance Laboratory. The building is constructed of non-ferrous materials, a permanent installation of modified Helmholtz coils compensates for the earth's magnetic field in the area, and automobile parking is prohibited in the

vicinity. Within the building, magnetic fields can be duplicated to simulate any which might be encountered by a ship under test, or ship models can be studied in an area completely free of magnetic influence. Results will help in protecting ships against influence mines and torpedoes. Equipment operation is handled by a master console with 357 controls.

Kodiak Build-up

Naval expansion at Kodiak, Alaska, to cost $21 million, will begin this spring with construction of transmitters and radio direction finders for air-sea rescue work.

New Rocket Test

Another high altitude rocket will be launched by the Navy this spring in an attempt to beat the record of 135 miles made by the Viking No. 7 last August. Rocket No. 8 will be a redesigned Martin Viking with greater fuel capacity, power plant generating approximately 20,000 pounds of thrust. Telemetering equipment will be carried, as before, to furnish readings on altitude, speed, temperature and cosmic ray count.

Navy in Industry TV Training

Nineteen commissioned and non-commissioned officers of the Navy were recently awarded diplomas by the Philco Corporation upon completion of a television training program. The members of the graduating class were the first armed forces personnel to be trained in the television art by private industry.

Especially designed and developed by Philco's TechRep Division in conjunction with the Bureau of Ships, the six months' television course completed by the Navy group covered maintenance and operating techniques on all types of television transmitters and receivers, as well as studio equipment. Television microwave relay equipment and the latest developments in color television were studied during the latter part of the course. An extremely important phase of the training program comprised field trips to transmitter sites, microwave relay stations and television studios in addition to lectures on the television art by severally nationally known television engineers of the Philco Corporation.

AFCA Group Member Personnel Changes

Hoffman Radio Corp.

Richard A. Scott, from Los Angeles office, appointed general manager, and *Byron W. Brown* sales manager, of San Francisco operations.

RCA Communications, Inc.

Thomas D. Meola, appointed vice president in charge of New York District. Was manager of public offices and sales, and previously had been European manager.

Major General George I. Back, Chief Signal Officer, inspecting the honor guard on his first visit to Camp Gordon, Ga., since becoming head of the Signal Corps. The guard was selected from members of Companies 8 and 20 of the camp's basic training group.

RCA Service Company

Hugh P. McTeigue, appointed to direct military electronics training program.

Bendix Radio Division

V. C. Judd, appointed district sales manager of new radio sales office, Detroit.

American Radio Relay League

Rodney H. Newkirk, appointed to editorial staff of QST.

General Electric

George C. Trotter, appointed sales manager for Air Force equipment. *Lawrence R. Cohen*, sales manager for Army equipment.

Philco Corporation

Dr. Courtnay Pitt, vice president—finance, appointed to management policy committee of board of directors.

Admiral Corporation

Richard F. Dooley, vice president, retired February 15, will continue as director.

Radio Control For Airborne Lifeboat

Westinghouse Electric Corporation has announced completion of final acceptance tests on a new radio control for an airborne lifeboat that can be dropped by parachute from an airplane and unerringly guided to survivors in the water.

A Westinghouse-designed electrical control system that uses the radio signal from the air to control the engine and equipment for driving and steering the boat has successfully passed trial runs at Lake Pymatuning, 25 miles north of the company's transformer division at Sharon, Pa., as well as final tests conducted by the Air Force at Mobile, Alabama. The Westinghouse transformer division holds the development contract from the U. S. Air Force. This is the same plant that developed the electric torpedo for the U. S. Navy during World War II.

The electrical control system for the lifeboat was designed by company engineers around a radio transmitter-receiver set developed by the Wright Air Development Center, Wright-Patterson Air Force Base, Dayton, Ohio.

After the 30-foot-long craft is dropped by parachute into the sea from the rescue airplane, radio signals at five different frequencies take over complete control in individual stages. The stabilizing fins that hold the boat steady as it leaves the plane are jettisoned. A guard protecting the propeller and rudder is freed. The engine air vents are opened. The motor is cranked up and automatically choked. Following this, the clutch is engaged and the throttle advanced to send the craft forward under the guidance of the radio controller.

When the lifeboat reaches the survivors, the airborne operator can bring it to a halt until the survivors board and then set the boat on its course again. If the physical condition of the rescued men is good, they can take over control of the boat themselves. If they are too weak for this activity, the airborne operator can guide them to shore or a rescue surface ship. The boat is equipped with triple controls, permitting passengers to break off radio control at any time and operate it electrically or manually.

"To activate the boat's power plant," explained Thomas A. Daly, manager of ordnance engineering at the Sharon plant, "requires an electrical control system incorporating electronic amplifiers, relays, and actuators. Each signal is used to perform a specific group of functions, and the electrical control system is so designed that it carries out each duty separately and in the proper order."

The first set of operations after the boat strikes the water consists of the five separate stages described above. The radio signal controlling these functions is transmitted to the boat at a frequency of 955 cycles a second. Another radio signal—this one at 3000 cycles a second—now goes into action. The gear shift is advanced from neutral to forward and at the same time the throttle is advanced to half speed, the engineer said. To turn the boat left, a radio signal of 650 cycles acts on the magnetic compass steering mechanism. For a right turn, a signal of 300 cycles is used.

"For emergencies, the airborne operator uses a fifth frequency of 1390 cycles," Mr. Daly added. "In the event that the magnetic compass steering system should not work, this signal bypasses it and works directly on the steering apparatus itself."

If the survivors are too weak to handle the boat manually—and if contact with the rescue plane is lost—a push-button control system is available.

The 3500-pound craft can hold 15 men, with provisions for 10 days and fuel for an 800-mile cruise. It is also equipped with "walkie-talkie" radio sets for boat-plane communications, a machine for distilling fresh drinking water from sea water, and a zipper canopy to protect survivors against the boiling sun.

Available To AFCA Members Ceramics Manufacture Book

A detailed pictorial story on the custom manufacture of technical ceramics has been published by the American Lava Corporation, and the company has announced that copies are available to AFCA members.

The ceramics story, told in pictures and diagrams, commemorates the fiftieth anniversary of American Lava, and was prepared in the belief that the presentation will be of great value to any designer, engineer, or purchasing agent who deals with technical ceramics.

A copy can be obtained by request on your letterhead to the American Lava Corp., Chattanooga 5, Tenn.

Wrist Watch Radio Possible

The comic strip wrist-watch two-way radio may become a reality in a new "era of germanium" in the electronics industry.

I. J. Kaar, manager of engineering for the G-E electronics division at Electronics Park, Syracuse, N. Y., said that the development of transistors has brought tiny radios like those used by the comic strip character within the realm of possibility.

Transistors and another product, the diode, are made from a silver-like metal, germanium, and promise to have an

effect on the electronics industry comparable to that of the vacuum tube, Mr. Kaar said.

He told members of the American Management Association, meeting at the Hotel Statler, that "a really personal radio of hearing aid size running indefinitely on one set of batteries is within sight. The Dick Tracy wristwatch two-way radio is no longer possible only in the comic books."

Mr. Kaar predicted that transistors, tiny pellets of germanium which can be made smaller than the head of a match, will be used extensively as substitutes for many vacuum tubes. He said both transistors and diodes are smaller, more efficient, cheaper to operate, longer-lasting, and potentially less expensive than vacuum tubes.

As to the tube industry, at present a $430,000,000 a year business, Mr. Kaar said that it may eventually concentrate on high-frequency tubes and picture tubes for which germanium products are not suitable substitutes.

"It is possible or even likely that these two kinds of tubes may fully load all existing tube facilities and perhaps even require expansion to keep pace with the industry," Mr. Kaar said.

"It is difficult to predict all the effect germanium may have, to foresee the magnitude of growth it portends, or to conjure up all of the new products and techniques that may emerge and their effects on marketing and industry," the G-E official said.

"The giant digital computers, or magic brains, which at present use several thousand vacuum tubes and occupy a large size room, can conceivably become small enough and incidentally, reliable enough, to apply to the everyday business and industrial problems as we now apply desk calculating machines.

"In military electronics the simplicity and ruggedness of the transistor, as well as its small size and low-power drain, will have a direct effect on all equipment, particularly that which is airborne.

"In the telephone business it will become entirely practical to build amplifiers for use on cables at the bottom of the sea," Mr. Kaar said.

He described germanium as metallic in appearance, silvery grey, and extremely hard and brittle. It is recovered as a by-product in the smelting and refining of zinc ores.

Rives and Oldfield Head G-E Cornell Electronics Center

Brig. Gen. Tom C. Rives (USAF, ret.) has been appointed manager and Homer R. Oldfield, Jr. resident manager of the newly established General Electric Advanced Electronics Center at Cornell University, Ithaca, N. Y., it was recently announced by Dr. W. R. G. Baker, vice president and general manager of the G-E electronics division.

Gen. Rives, who retired in June of 1949 after over 31 years of military service, will have overall responsibility for all phases of the new electronics center, while Oldfield will have direct responsibility for all administrative and business operations with headquarters at the center. Gen. Rives' headquarters are at Electronics Park, Syracuse.

Tom C. Rives

During World War II, Gen Rives served as chief of several divisions in the Office of the Chief Signal Officer, and as deputy air communications officer of the Army Air Forces. He was given the permanent rank of brigadier general in 1944. From 1945 to 1949 he served as chief, electronics sub-division of the Air Materiel Command at Wright Field, Dayton, Ohio. Among his decorations is included the award of Honorary Commander of the Order of the British Empire from the British government for his work in coordinating the electronics research and development of the U.S. and the U.K. during World War II.

Upon retirement in 1949, Gen. Rives joined the University of Illinois as a special research associate professor and was associated with the engineering experiment station of the electrical engineering department. He joined the G-E electronics division in May 1950, and in May 1951 was appointed assistant to the manager of the commercial and government equipment department.

A native of Montgomery, Ala., Gen Rives received his B.S. degree in electrical engineering from Alabama Polytechnic Institute in 1916, and the professional degree of electrical engineer in 1917. He received his M.S. degree from Yale University in 1927. He is a senior member of the Institute of Radio Engineers, a member of the Research Scientists of America, and of the Armed Forces Communications Association.

Oldfield was born in Mount Vernon, N. Y., and holds B.S. and M.S. degrees in aeronautical engineering from the Massachusetts Institute of Technology. Prior to World War II, he was a research associate and instructor at M.I.T. where he was in charge of the instrument laboratory under Dr. S. C. Draper. This laboratory contributed greatly to the advancement of shipborne and airborne computing gunsights.

Homer R. Oldfield

In 1941 he went on active duty with the U.S. Coast Artillery Corps, participating in work on early microwave gun-laying radar. He became chief of the electronics section of the anti-aircraft artillery board in 1943, and was later promoted to major and assigned to the equipment division of the air communications office where he was in charge of the Air Force program for developing airborne fire control radar systems.

Upon release from active duty in 1945, he joined the government department of G-E's electronics division as manager of Air Force sales. In 1948 he became manager of sales for all government department sales, the position he held at the time of this latest appointment.

He is a senior member of the IRE, a member of the Institute of Aeronautical Sciences, an associate member of the Scientific Research Society of America, and a member of the Armed Forces Communications Association.

Push-Button Tape Recorder

A tape recorder for audio recording which offers for the first time push-button operation in a tape recorder recording up to 15,000 cycles per second at a tape speed of 7½ ips, has been announced by the Ampex Electric Corporation of Redwood City, California.

The recorder, which produces recordings of highest professional standards, is available with heads for either half-track or full-track recording. It can be operated at either 7½ or 15 ips as controlled by a selector switch, and proper equalization for either speed is available for the operator's selection. All mechanical motions are controlled electrically by push-buttons. The recorder can be arranged for remote control and is available in either portable case or for rack mounting.

Explorer Wilkins At Photo Center

The Signal Corps Photographic Center at Long Island City, N. Y., recently played host to the world-famous explorer, Sir Hubert Wilkins, who visited the post in the capacity of technical advisor on a series of pictures featuring Army life in the desert.

Sir Hubert first became famous as a photo correspondent for the Turkish Army during the Balkan Wars in 1912-13. From 1913 to 1917 he served as second in command to the Stefansson Party of the Canadian Arctic Expedition, and in 1921 as second in command to the British Antarctic Expedition.

The 63-year old Australian commanded the Detroit Arctic Expedition in

1926-27 and the following year led the Wilkins-Hearst Expedition to Antarctica.

The Signal Corps photo center plans to complete the desert film this February, according to Lt. Col. James B. Buchanan, executive for production.

Psychological Warfare Station

A powerful radio broadcasting station on wheels, designed to carry America's psychological warfare message into enemy territory, has been developed by the Signal Corps Engineering Laboratories at Fort Monmouth, N. J. The new station is expected to be put into operation by psychological warfare teams overseas by the first of the year.

Completed in a record four months' time, the station has the latest radio broadcast transmitting and receiving equipments and can be operated either on its own power or on outside commercial lines.

Housed in a pair of 26-foot trailers and three 11-foot shelters, the units may be carried by truc kand trailer on land; by cargo planes aloft, and by ships at sea. On amphibious assaults, the units could be floated ashore after simple sealing preparations.

The broadcast studio and control room are sound proof and air conditioned. Equipment includes the latest control consoles, magnetic tape recorder-reproducer units, tutrntabels, and remote pick-up units for on-the-spot broadcasts away from the studio.

Range of the station is several hundred miles. When needed, a portable transmitting antenna can be raised 500 feet into the air by balloons to allow the station to go on the air in a hurry. The station also can go on the air almost immediately from a captured town by using existing indigenous antenna equipment and other facilities.

More than a quarter-million words of copy can be handled by the station daily. It can receive, monitor and record voice, teletypewriter or continuous wave traffic.

New SCEL Fields Stations

Signal Corps Engineering Laboratories field stations numbers 2 and 3 have been established at Yuma Test Station, Arizona, and Milwaukee, Wiscontin, respectively. Field station number 2 will provide meteorological service for the Yuma Test Station. It has been established as a Class II activity under the jurisdiction of the Chief Signal Officer and a Class I activity under jurisdiction of the commanding general, Sixth Army.

Field station number 3, a class II activity under jurisdiction of the Chief Signal Officer, will take over the vehicular suppression and installation responsibilities of the Signal Corps Engineering Laboratories.

Gerald Egan

Gerald Egan, chief of the public information staff of the Office of the Chief Signal Officer during and for some time after World War II, and former associate editor of SIGNAL, died January 7 at the age of 66 after a long illness at Glenn Dale, Md., Sanatorium.

The news of the passing of "Jerry" Egan brought us a sharp twinge of sadness. Jerry was one of those whose exterior expression brings about a regard for him as a "salty" character, but who is in reality capable of deep sympathy and affection toward others. We will always remember Jerry's steady helpfulness when we were first becoming acquainted with his office.

A writer and public relations man in Washington for 45 years, Jerry was one of the founders of the National Press Club. In the year before his retirement in 1949 he and other charter members of the press club were honored in ceremonies at the club which were attended by President Truman and leading members of the Congress. Jerry's father was the noted American diplomat, Maurice Francis Egan, who was U. S. Minister to Denmark under four U. S. Presidents.

Ernest R. Cram

We have just recently learned of the death, in New York last September 3, of Ernest Robe Cram, 78, who had been a radio engineer with the Signal Corps for twenty-five years and was known for his work in the development of "wired wireless," forerunner of the present coaxial cable. He was a founder of the Society of Wireless Telegraph Engineers, which later became part of the Institute of Radio Engineers.

SigCorps Agencies Consolidate

The Signal Corps announced that its procurement agency and stock control agency have been consolidated effective January 1, 1952, with the combined agencies known as the Signal Corps Supply Agency to be located at the Signal Corps Building, 225 South 18th Street, Philadelphia, Pa. The procurement agency has been at that location for some time; the stock control agency has been at 2800 South 20th Street, Philadelphia, Pa.

Colonel W. Preston Corderman, commanding officer of the procurement agency, will command the new agency, and the deputy commander will be Colonel Glenn S. Meader who has been commanding officer of the stock control agency.

The supply agency will take over the functions of both the stock control and the procurement agencies.

In addition to the office in Philadelphia, the supply agency will have regional offices in New York, Chicago and Los Angeles; a procurement office in the Signal Corps Laboratory at Ft. Monmouth, N. J.; and a procurement office in the Photographic Center, Long Island City, N. Y. These offices have been under the control of the procurement agency.

The consolidation has been made in the interest of economy of personnel and efficiency of operations which are expected to result from contralization of operations and responsibility. This is in accordance with the Department of the Army's economy policies.

Baltimore Signal Depot Hq Moved

Headquarters of the Baltimore Signal Depot has been transferred from Middle River, Maryland, to 28000 Bruening Highway, Baltimore, Md. The building now occupied was formerly known as the Curtis-Caproni Building.

Besides the headquarters, the installation now consists of Annex 1 at Fort Holabird, Maryland; Annex 2, Schultz's Farm, Baltimore; Annex 3, 3000 Dundalk Avenue, Baltimore; and Annex 4, Glenn L. Martin Company, Plant 2, Middle River, Md.

Knight With X Corps

Major Morris S. Knight, of the Southern Bell Tel and Tel Co. of Tampa, Florida, was recently called to active duty and assigned as assistant signal officer of the X Corps in Korea. Before departing for Korea, he was stationed for a time at the signal school, Fort Monmouth, N. J.

Knight is a veteran of campaigns in North Africa, Sicily, Italy, France, and Germany in World War II.

1951 Sets Records For Camp Gordon Radio Club

Tabulating its progress for the past year the Camp Gordon (Signal Corps, Augusta, Ga., installation) Radio Club announces that in the handling of 15,946 messages in 1951 previous year records went tumbling. Other highlights of last year include the signing of the club's 1000th member, the club's affiliation with the American Radio Relay League, the taking of first place honors with more than 36,000 points in the world-wide DC contest, and the winning of the first "sticker" awarded anyone in the world by Panama Canal amateurs for contacting 50 stations in the Canal Zone.

The Camp Gordon Radio Club, serving in both MARS (Military Amateur Radio System) and regular ham circuits, is the network control station for the State of Georgia in the MARS system and is alternate network control station for the Third Army area. In ham circuits it is a member of the Georgia Cracker network and is one of the main outlets for messages being transmitted outside of the state. Other ham nets include the Atlantic network of the eastern seaboard and the fourth regional network of southeastern states.

"Ahoy—Is Maggie Murphy In?"

For the first two years, or so, of public telephone use, following the first switchboard and exchange installation in 1878 at Hartford, Conn., the common salutation used in answering a phone call was the nautical "Ahoy," according to a recent item in the Navy publication *All Hands*. The word "hello" has not been found in literature previous to 1880, the naval publication points out, but came into use during or after that year as a telephone response. Thomas A. Edison is credited with the introduction of the word, a variant spelling and pronunciation of the 16th century huntsmen's call.

New Director For CofC Radio-TV

Appointment of George H. Sandefer as director of expanded radio and television services was recently announced by Arch N. Booth, executive vice president of the Chamber of Commerce of the United States.

For the last eight and a half years Sandefer has been with the National Broadcasting Company. In the 1944-46 period he produced several network shows, including "America United," in which the National Chamber was a participant. His last position was controller of all NBC Washington, D. C. activities.

Worcester ROTC Unit

A recent issue of the Worcester Polytechnic Institute Journal describes activities of the school's ROTC Signal Corps unit, pointing up the advantages to the student in taking part in such units. Some military service is almost a certainty in the future of today's youth, the Journal's article stresses, and the ROTC program offers an opportunity to serve while studying and to study while serving.

The basic course, for the Signal Corps unit, consists of three hours of formal instruction per week and continues for the first two academic years. During the first year the instruction is general in nature and applicable to the Army as a whole. The second year's work applies particularly to the Signal Corps.

The advanced course, which is optional, requires six hours of time per week plus one six-week period at summer camp. During this two-year period a large portion of the work is peculiar to the Signal Corps, while the balance is common to all services. This course leads to a commission as a second lieutenant in the Signal Corps, after which a minimum of two years' active duty is required.

Signal Corps personnel directing the activities of Worcester's ROTC unit are Lt. Col. Charles E. Harris, Lt. Col. James E. Foster, Lt. David F. Edwards, Jr., M/Sgt. Carl E. Staab, M/Sgt. Eric J. LeCouture, Sfc. John Gregal, Sgt. Roger H. Burke, Sgt. Charles E. Barrentine.

Duck—Then Up & At-om

(*Continued from page* 14, *col.* 3)

us and the weapon going off as soon as possible, in order to nullify or materially reduce the effect of blast, heat and radiation. The time is short, but we have time to do something. The last effect, the psychological effect which will cause great fear and finally the panic must be guarded against by both our military and civilian population. We hope from the description given that you basically understand the picture of the weapon, what it will do, and what you can do about it. If such is true the panics that took place in the flight from the city after the Chicago fire will not occur. If it does, the road net of the average military area or civilian area will not be able to stand this mass exodus. Unless you develop a feeling for this weapon, and a feeling for what to do, you will be killed in the rush. I think we see here again the importance of communication and a network of control. The protection we have discussed certainly holds for the communicator operator since his loss breaks the lifeline between the command organization and the man on the street or in the ranks. Until we have developed mental telepathy to a point where it is usable, the lifeline of the atomic network is *Signals*.

In conclusion, let's say that we have only discussed the weapon going off in the air, the most logical place for the explosion. We hope we have given you a feeling for how the fission reaction takes place, for what it looks like, for the effects that can be gotten, and most of all for what you can do about it at any reasonable distance. If you will turn and fall, getting lots of material between you and the bomb, then at the end of ninety seconds stand up and go about your job, the effective radius of gross destruction (Figure 5) for a nominal bomb at a nominal altitude will be greatly reduced.

Overall, let us say, *Signals*: *Duck!! Then Up And "At-Om"!!*

Hallicrafters

(*Continued from page* 35, *col.* 3)

maximum flexibility. Incoming materials and components are unloaded at enclosed receiving docks and move smoothly through the pre-test department to the nearby stockrooms. From there, with a minimum of handling, they are fed to the five main assembly lines. Shipping docks are at the opposite end of the building.

Offices and engineering department are air conditioned and a roof sprinkler system lowers the temperature in the factory 12 to 15 degrees on hot days. There are three automatic overhead conveyors—one with a "hot rail" on which completed TV chassis are given a four hour run-in test before being assembled in cabinets. Other conveyors deliver picture tubes and chassis pans to the lines.

Typical of the flexibility which permits production to be shifted quickly from one type of unit to another are the three-rail chassis racks used on the assembly lines. These carriers developed by Hallicrafters engineers, replaced the jig formerly used under each chassis. The rails may be readily adjusted to chassis of varying sizes, and chassis slip along directly on the rails. Plant production supervisors boast that a complete production line of up to 130 people can be changed over from one type of chassis to another, position by position, with less than one minute's delay between the last unit of one run and the first unit of the next run.

Besides the main plant, Hallicrafters occupies a recently purchased three story building of 72,000 square feet two blocks east of the main plant, and a coil factory of 11,600 feet on Chicago's north side. On the southwest side of Chicago 150,000 square feet of space, under long term lease, is utilized mainly for assembly of large, complex military equipment; this combined with other additional space of 125,000 square feet used for storage and shipping facilities give a grand total of over 500,000 square feet of space. These combined production facilities are sufficient to turn out approximately 600 communications and radio sets, and 1,500 television sets per day, using one shift in the radio department and two shifts on some of the television assembly operations. This is exclusive of contract military production. Plant executives point out that either communications equipment, radio set, or television set production can be quickly and substantially increased by decreasing output of the others.

The company's normal staff of approximately 2,500 employees, of whom 1,960 are factory workers, have the use of modern cafeteria, wash room and locker facilities, and benefit from company paid group insurance, paid vacations, Christmas bonuses and a liberal profit-sharing pension trust. As a result relations with the employees have been tranquil and Hallicrafters has fared well in competition with other employers for desirable workers.

As the 1951-52 rearmament program gets under way, Bill Halligan faces with equanimity the prospect of expanding output to attempt to care for the civilian market while at the same time producing a growing volume of equipment for the armed forces.

"We are firmly committed to a policy of relying on component suppliers and subcontractors to the fullest possible extent" he says. "In this way we are able to use the specialized facilities and skills of many manufacturers. and by breaking down each operation into relatively simple components, can step up production as needed by utilizing less highly skilled workers under the direction of our highly trained engineers and inspectors."

Early this year Hallicrafters had already added more than $26,000,000 in government contracts to its normal backlog of civilian business and substantial additional contract work was in process of negotiation. HT-4's and various types of military receivers were once more moving in quantity down the assembly lines and into the testing booths. Procurement facilities were being stepped up and plans for additional space and personnel, as needed, were being worked out.

Into your home, through the miracle of television, comes a new world of entertainment, news, education, and sports.

They can still go out while staying home

Now "homebodies" who seldom leave their neighborhoods can view programs from distant cities—with all the comforts of home. Drama, comedy and variety shows are brought into the living room. Sports, news events as they happen can be viewed by all. Now television is open coast to coast . . . Those in the East may look in on the West, and the West may look in on the East.

Television is enjoyed in more than 15 million homes, as a result of research at the David Sarnoff Research Center of RCA at Princeton, N. J. Today's image orthicon TV camera was perfected there. Dr. V. K. Zworykin of RCA developed the *kinescope*—which is the screen of television receivers. And RCA scientists have also perfected electron tubes, circuits, sound systems, phosphors, and antennas to make television part of everyday life.

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* * *

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Books — and services —

ELIAS E. RIES, INVENTOR. By Estelle H. Ries. Philosophical Library. 4.75.

Probably everyone, except those who have made a careful study of the biographies of every inventor who ever had a hand in the discovery or development of some practical device, has experienced something between surprise and amazement upon becoming acquainted with the work of some inventor who has been in the thick of discovery or development of new scientific principles, but whose name is not in the general knowledge, as is Edison, De Forest, Marconi, or Bell. Most school children associate names and inventions like Whitney and the cotton gin, or Fulton and the steamboat, but it is doubtful that many of them, or even many adults, know that Elias E. Ries began the experimental work which resulted in the "talkie"—motion pictures with synchronized sound on film. This is but one of the surprises which come from reading the biography of Ries.

Though the name of Ries is not now commonly included in the list of great scientist-inventors, his biography, written by his daughter, reminds that about 30 years ago he and his work had considerable publicity as the result of patent litigation. Among newspapers carrying stores concerning the litigation, the *New York American* pointed out, "In addition to his discoveries in the field of talking pictures, he has perfected many other devices. These include the electric elevator controller universally used; the methods and apparatus for electrically welding track rails; the modern alternating or 'convertor' electric system which made possible signalling systems for safety at sea, and many others. Mr. Ries has taken out over 200 patents, of far-reaching importance. With reference to the talking picture invention, patent claims have been granted him which control the art."

Even to those somewhat famiilar with an inventor and his works, it frequently comes with surprise to learn that his conceptions and experiments took place much earlier than had been commonly supposed. This should be the effect on most readers of the Ries biography.

In the case of the talking picture patent, referred to by the *American*, the first related patent was applied for by Ries in 1896! He appears to have hit upon the idea of recording sound on film in his first examination of motion picture machines earlier that same year. Also in the same year, 40 years before its inauguration into regular service, Ries had forecast the telephoto. Two years later, in 1898, he actually transmitted pictures over several hundred yards of wire. With his mind in that channel, he of course was thinking of television too. The *New York Journal* in that year apparently had faith in Ries, for it predicted that "the new invention will do precisely what Bell has done with sounds . . . the picture will be perfect in every detail, just as the transmitted sounds on the telephone are repeated accurately, even to the slightest modulation. (The *Journal* seems to have had faith in the engineers too.)

Most inventors working on their own, Miss Ries points out, have many heartaches in trying to protect their rights in the devices and developments born of their own minds. Her father had repeated and crushing disappointments, and this drama in itself makes her book highly interesting reading.

TV AND ELECTRONICS AS A CAREER. By Ira Kamen and Richard H. Dorf. John F. Rider, Publisher, Inc. $4.95.

Not a technical book, this is principally about the people in radio and television broadcasting, communications, manufacturing, engineering, distribution and sales, and servicing. The book is aimed at young people planning a career, to show what electronics offers and how to take up the offer; and those already in electronics, to acquaint them with the opportunities for advancement, and other specialties in their field.

In addition to eight chapters covering the various phases of activity in the electronics industry, useful appendices include typical salaries for operating personnel in small and large radio stations, the curriculum of electrical engineering courses at Illinois Institute of Technology, and a listing of public and private schools teaching radio and TV courses. The volume contains 130 illustrations of the industry at work.

THE ARMY AIR FORCES IN WORLD WAR II. Volume III. Europe—Argument to V-E Day. January 1944 to May 1945. Edited by W. F. Craven and J. L. Cate. USAF Historical Division. The University of Chicago Press. 948 pages. $8.50.

By the June 1944 day of the Normandy invasion the German Air Force had reached such a point of ineffectualness that it refused to challenge the channel assault. Yet only a few months before, at the beginning of that same year, German fighter strength was still on the increase and a cause of considerable concern to the Allies. General "Hap" Arnold was stressing the necessity for the destruction of the German air arm "in the air, on the ground, and in the factories."

In November 1943 Eighth Air Force had drafted a plan—"Argument"—for a series of closely spaced attacks against about a dozen German factories producing fighter components or fighters. The conception of this plan and its execution, interwoven with the planning for and the carrying out of the great invasion opens Volume III of the history of the AAF in World War II. The book closes with V-E Day after covering the tremendous panorama of the two invasions of France and the push into Germany.

Ground force views of World War II European and Mediterranean strategic planning and combat action have been detailed and published, in the greatest coverage of any war, in official and informal histories and in memoirs. Now in this history of Air Force action in that area there is presented the air view, and the vast and varied problems of the ETO and MTO air war. Information is revealed in this volume which is published in detail for the first time. Two examples are the projects Crossbow and Frantic.

The plan Crossbow was set up to seek out and destroy "ski" sites from which the German V-1's and V-2's were being launched. Allied bombing was successful in slowing up the launchings, but only after intense experimentation in methods. Frantic was the code word for the triangular shuttle run from England to Russia to Italy and back to England. The code word seems to have been chosen by someone with a gift for prophecy, for all attempts to arrive at cooperation with the Russians only led to frustration.

MEN OF WEST POINT. By R. Ernest Dupuy, Col., USA, Ret. William Sloane Associates, Inc. 486 pages. $5.

The title of this book is to be taken literally, since the volume is not so much about the U. S. Military Academy itself, as it is about the men who made the academy and those who the academy produced.

The names of many illustrious sons of West Point are familiar to most Americans; Colonel Dupuy spotlights the high points in the careers of the principal of these. But there were others not so well known, since their achievements, though equally great and enduring, were not in gigantic combat actions. Their stories make some of the most interesting reading in Men of West Point.

There was Denis Hart Mahan, now a legendary figure at the military academy. His brilliant career, in the early days of West Point would make a great book in itself. His genius far outran his

time, for his concept of utmost mobility in ground warfare did not find full appreciation and fulfillment in practice until as recently as World War II. Perhaps it was because his thinking was so advanced that he did not receive the general recognition and fame which came to his son, Alfred Thayer Mahan, the writer of the sea power classic.

One of the West Point's greatest was its first superintendent, Sylvanus Thayer, class of 1808, the thirty-third graduate of the school. The Military Academy as it stands today, says Dupuy, is the product of Thayer. Upon his appointment to the superintendency he "strengthened the weak points in the institution, not only rebuilding it but also running it upon principles which have stood the test of time for a century and more."

The publication of Men of West Point this year coincides with the one hundred fiftieth anniversary of the U. S. Military Academy.

PRINCIPLES OF RADIO. Sixth Edition. By Keith Henney and Glen A. Richardson. 655 pages. $5.50.

This latest edition of *Principles of Radio* represents a complete overhaul, much new material having been added, with all older material rewritten, rearranged, or deleted. The same viewpoint has been retained, however, which made the earlier editions useful to those who must learn radio without help of a teacher—that the text must be as clear as it is possible to make technical matter. Illustrations and problems are also all new or revised.

Mr. Henney is editor of Nucleonics, and a former editor of Electronics. During WW II he served as editor-in-chief on a University of California NDRC project preparing maintenance manuals on sonar equipment for the Navy's Bureau of Ships. He is a Fellow and past director of IRE, Fellow and past president of the Radio Club of America, and an Associate of the Photographic Society of America.

Professor Richardson has worked for the Radio Corporation of America, as engineer working in the development of UHF test equipment; for the Commonwealth Edison Company of Chicago; and the Wilcox Electric Company, writing instruction manuals for aircraft radio equipment. He was an instructor in radio engineering, industrial electronics, and electrical circuits at the University of Kansas, and at present is assistant professor of electronics, Iowa State College.

HOW TO PASS RADIO LICENSE EXAMINATION. Third Edition. By Charles E. Drew. John Wiley & Sons, Inc. 366 pages. $4.50.

This volume is designed to assist the reader in determining whether he has sufficient knowledge of the field of radio communications to pass an FCC examination of any type of radio operator license or permit, excluding aircraft radiotelegraph and ship radar techniques license endorsements.

While not a textbook, the book does contain all essential information needed to pass the examinations for a radiotelephone restricted operator permit, radiotelephone third-class operator permit, and radiotelegraph third-class operator permit in basic law and basic operating practice.

BROADCAST OPERATOR'S HANDBOOK. By Harold E. Ennes. John F. Rider Publisher, Inc. 440 pages. $5.40.

In bringing out this second edition of the operator's handbook, the aim of the author has been to bring the information presented in the volume completely up-to-date. The technical aspects of production and programming have been given more attention, and the edition has been expanded to cover this field in some degree of thoroughness. All other subjects are also treated more fully than in the first edition, an outgrowth of innumerable questions from students in basic radio classes, and many helpful suggestions from interested readers already engaged in broadcast operations.

The subject and content of the book are intended not only for the newcomers to control rooms and transmitters, but also for experienced personnel fa-

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Price—4 for $1.

miliar with all the problems peculiar to their work. The first four parts cover the operating practice in control rooms, the master control, remote controls, and the transmitter. The latter parts are concerned with technical data for operators and engineers.

THE GRAPHOLOGIST'S ALPHABET. By Eric Singer. Philosophical Library. 117 pages. $3.75.

Here is a presentation of the art of graphology that is easy to understand, and effective in its use as a work of reference. It sets forth in illustrations and text the numerous ways in which each of the alphabet can be handwritten, and describes characteristics denoted by various deviations from normal writing.

Other sections of the book deal with the deductions which can be made from opening strokes and end strokes of written words, dotting of i's and crossing of t's and the various differences in speed, angle, connection and ornamentation between one style of writing and another.

Two Books On Communism

The Anatomy of Communism, by Andrew M. Scott, and Soviets in Central Asia, by W. P. Zelda K. Coates, published by Philosophical Library, give two slants on communism.

Mr. Scott says he is being critically analytical of Marxism. We're not sure. Find out for yourself, if you're interested.

The Coates come up with a large slice of baloney, the kind which is so heavily spiced with fraud as to make it fascinating. In all their travels through the U.S.S.R., they tell you, they have never seen anything resembling forced labor, and they assert that the Soviets have proposed an international investigation of labor conditions! Whew!

INDEX TO ADVERTISERS

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HANAC

(*Continued from page* 11, *col.* 3)

below 50,000 feet. To provide for this requires that stations operating on the same frequency shall be separated by at least 600 miles. Thus, a pilot traversing this route at 40,000 feet need only to set his VOR receiving equipment on one VOR channel for the entire run. He many experience dead spots midway between the 600 mile stations, but at the speeds he will be traveling these spots will be of so short a duration as to be inconsequential to his operation. Similar geographical distribution and frequency staggering will provide for other families of VOR's for corresponding lower altitudes.

As a concluding note perhaps it is well to mention television as a means of providing ground-to-air communications. Without getting into a discussion on the economic utilization of the radio spectrum, it is interesting to note that present day 525 line entertainment television has sufficient resolution to permit easy reading of about 40 miles of ordinary page type. This means that within a given congested area where there may be thirty or more separate communications channels required to carry the communications load on a minimum interference basis, a single television channel (minus sound channel requirement) could handle simultaneously forty individual messages provided, however, that each message can be contained within the length of a single line.

There are many aspects of visual presentation psychological and otherwise of air traffic control data that should be investigated. For example, it is an accepted fact that visually presented information is easier to assimulate and retain than aurally presented material. It seems likely, therefore, that a very lengthy clearance could be copied symbolically by a pilot within a fifteen (15) second interval or less, thus increasing the rate of message handling.

Attempts have been made in the past to study visual presentation using television. The USAF Teleran* program started out in this direction but, unfortunately, it became so hopelessly embroiled in engineering problems that it barely disturbed the dust on the proverbial "operational surface" let alone scratching this fictitious surface. Maybe an answer to the vexing communications problem lies within the realm of television. This we'll never know as long as it is allowed to sit in a dark corner, gathering cobwebs while on the other hand we continue in our quest for more and more radio channels, which has yielded us a chunk of spectrum about 57 times wider than a single TV channel. Yet we still have problems.

*SIGNAL, Jan-Feb 1948 issue, "Teleran" by W. W. Watts.

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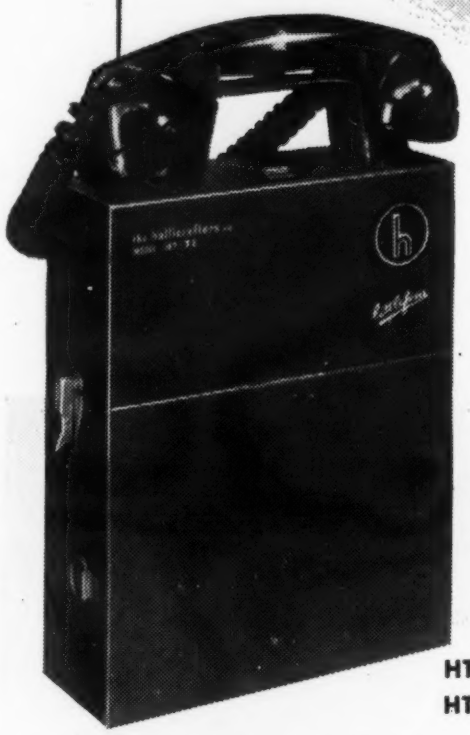

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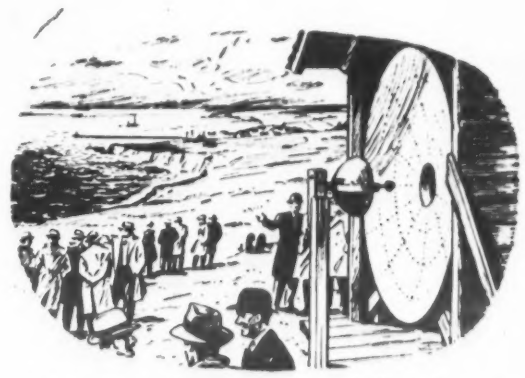

IT&T engineers successfully demonstrate first voice transmission by microwave, Calais to Dover, March 31, 1931.

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